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Hemorrhagic Septicemia in Bovines

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HEMORRHAGIC SEPTICEMIA is a disease which has been recognized in many, and perhaps in most parts of the civilized world for many years, but not until comparatively recent years, has it been reported in the United States.

In 1901 the Minnesota State Board of Health issued a bulletin on the subject which was of supreme interest. It was the first really comprehensive report that had come under my observation from any source in this country. In it was an account of sixty outbreaks in that state, with symptoms and postmortem lesions observed, also the result of experimental inoculation in other animals.

Prior to that time (in 1900) it was my experience to have investigated several outbreaks of peculiar character, among cattle in Illinois, but not being familiar with the characteristics of hemorrhagic septicemia (under that name) it was my custom to report them as "acute septicemia."

One such occurrence, which is very fresh in my memory, was in February, 1900, in Macoupin county, on a farm to which I was called to investigate a disease which had been pronounced contagious pleuropneumonia, in a herd of feeding steers. Several had died and the neighbors had become greatly alarmed over the situation. Upon arrival at the farm, accompanied by a member of the legislature, about 9 p. m., we found a dead steer enclosed in a rail pen at least 10 feet high, to prevent invasion by dogs or wild animals.

The next morning an autopsy was held and very plain characteristic lesions of hemorrhagic septicemia were observed, but for reasons mentioned, it was pronounced "acute septicemia." The owner was advised to remove the remaining animals from the low lying feed-lot which they occupied, to high ground, and there were no more losses.

The first recognition and proper classification of hemorrhagic septicemia in cattle occurred in November, 1902, on a farm in White county, a brief description of which will probably be of interest to those engaged in cattle practice. This investigation was conducted November 19 and 20, on a farm situation about three miles west of Carmi, owned by John M. Crebs, member of the State Board of Agriculture, and occupied by a tenant named Stephens. An extremely peculiar condition was found. I was informed that on the morning of Oct. 31, a cow which appeared perfectly healthy at milking time the evening before, was dis-

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covered in a dying condition and only survived a few minutes.

Infection Spreads from Carcass

Stephens removed the hide, or caused it to be done by a butcher, and a peculiar "yellowish" appearance was noted in the tissues about the throat, but nothing abnormal was noticed elsewhere. In about ten days the butcher who skinned the animal had a peculiar sore arm, his hand and arm being very much swollen with red patches in the skin, but it responded to the treatment of a physician. The carcass of the cow was burned and all other cattle were removed to another pasture, where they were left until November 11, when they were returned to the one they had previously occupied. On the 18th, just one week after their return, a cow was discovered presenting symptoms similar to the one which died on October 31, and she lived only a few minutes.

This cow, at milking time in the morning, was apparently in good health.

On the same date (18th) a cow and bull calf were observed to be very lame, the former in the left hind foot, the othe in the left fore foot or limb, both animals also being ill. Upon my arrival on the 19th, I was shown a cow which had not been expected to live the day before, as she had presented symptoms similar to both the animals which had died, but a careful examination revealed nothing wrong to me, temperature normal and otherwise well.

A very careful examination of the lame cow and bull calf did not reveal sufficient cause for the extreme lameness in both, but as the owner admitted that he had removed a piece of rope from between the digits of the lame foot of the cow, at the time I concluded that might be the cause, yet was somewhat in doubt. Her temperature was 104.6° (about 4 p. m.) and when standing, her back was considerably arched, but there was no evidence of pain elsewhere than in the foot or limb, and the owner said that she had eaten a little corn that day.

The temperature of the calf was nearly the same, being 104.8°, and no cause for his extreme lameness was discovered.

All the other cattle seemed perfectly well, but from the history of the fatal cases and the conditions then observed I apprehended that a more serious condition might be present than could at that time be seen, although the two cases did not present any symptoms similar to the two fatal cases. We left the farm about 5 o'clock and returned to town, after requesting the owner to notify Mr. Crebs if anything serious occurred during the night.

The next morning, not hearing anything from the case I took a train for St. Louis, and had gone about 75 miles when a telegram was handed me by the flagman, informing me that the cow and calf were both dead, and telling me to use my judgment about returning. My judgment prompted me to return by the first train and I arrived at the farm about 2 o'clock p. m. They were removing the hide from the cow when we went to the field. Numerous patches (hemorrhagic) were seen in the subcutaneous tissue, along the ribs and back, varying in size from that of a grain of corn to an inch in diameter, some being surrounded by a gelatinous exudate. The connective tissue in the region of the neck and back was discolored to some extent by blood effusion of slight degree. No evidence of gas formation existed, nor was the extravasation of the character seen in blackleg. Careful observance of the tissues around the region of the digits did not reveal sufficient cause, apparently, for the lameness which had existed, although a slight discoloration was present.

Autopsy Discloses Marked Lesions

Upon opening the cavities of this animal very marked lesions were found. The entire left lung and anterior lobe of the right were intensely hemorrhagic, the heart containing a small quantity of dark clotted blood. The small intestine was the seat of the most marked lesions, hemorrhages existing in sections throughout its entire length, the fecal content being saturated with bloody exudate, some parts of the intestine containing nothing but the exudate. The liver seemed to be softer than normal. The spleen was possibly somewhat enlarged, with pulp a little softened and darker than normal. The bladder was much distended with high colored urine, but there was no sign of red coloring matter.

Upon opening the udder it was found to be completely saturated with extravasation of blood throughout its struc-

ture, which could be squeezed from it as from a sponge.

The carcass of the calf was then subjected to autopsy, and the same peculiar conditions were observed, in the subcutaneous tissue, possibly to a greater extent than in the cow. Discoloration of the tissues about the fetlock was present in the left forefoot.

The lungs were hemorrhagic, that is the entire left lung and the anterior lobe of the right, being the same parts that were affected in the cow, which I deem to be a coincidence. Extensive patches (hemorrhagic) existed throughout the small intestine identical with those found in the cow. The spleen was as large as that of the cow. Its capsule, as well as that of the cow, showed hemorrhagic patches and the pulp was darker than normal and somewhat softened. The bladder contained a considerable quantity of "bloody urine," very dark.

From these observations, and from the history of the two cases which had died before my investigation, my diagnosis was hemorrhagic septicemia in all of them, an infectious disease, and I advised the removal of all animals from the supposedly infected pasture.

The carcasses were cremated. There were nine horses and mules which had occupied this pasture continuously for several months which remained in good health. A mention of the character of this pasture seems of interest, as it is typical of all the fields upon which this disease has come under my observation. There was a ravine which traversed it and there has also been a similar one in every field where hemorrhagic septicemia has been my diagnosis. This may be coincidental but it would seem otherwise from the number involved.

In the same month (Nov., 1902) on a farm near Springfield, several steers had died, supposedly from corn-stalk disease, at least that was the diagnosis of the veterinarian in attendance. These steers had been fed upon shock-corn and after the diagnosis, that feed was discontinued for eight days when another died. The veterinarian asked me to accompany him and assist in holding an autopsy, which I did, and the lesions found were plainly those of hemorrhagic septicemia, the most marked of which was an extensive subcutaneous extravasation on the chest wall in the region of the left shoulder-joint, within which there was no gas formation. The subcutaneous tissues on the belly and along the region of the withers and neck showed extensive effusion. Upon opening the body cavities typical lesions were also observed. The entire left lung and the anterior lobe of the right contained abundant extravasations. Several small hemorrhagic patches were seen throughout the small intestines. Spleen normal in size, pulp quite dark and softened; liver somewhat lighter in color than usual, and friable; extensive gelatinous exudate along the region of the back on the right side. The veterinarian in charge was led into his error in diagnosis by getting his information about so-called cornstalk disease from a published work by quite an eminent pathologist who had described hemorrhagic septicemia most excellently, but had called it cornstalk disease. The rest of the animals were removed from the feed lot and there were no more losses.

In connection with this case it would seem of interest to call attention to the character of the feed-lot which had a ravine running through it, and to the further fact that a few years after this last mentioned outbreak there was another in calves in the meningeal form.

A large dairy barn had been built, the rear of which extended into this ravine. This barn had a basement, one corner of which was on very low ground. In the spring following its construction several calves that had never been out of the barn, and whose rations consisted entirely of milk, died mysteriously. After several deaths the veterinarian in charge, remembering what had occurred on this ground among the steers, called me in consultation, and upon our arrival we found a dead calf and one dying in convulsions. While conducting an autopsy on the first, the other died and we held one on that. Both cases revealed meningeal hemorrhages.

Acute Form Prevalent In Illinois

In Illinois most of the cases of hemorrhagic septicemia appear in the acute form, in so far as my knowledge extends, but according to reports in other states it appears in the subacute or chronic form also.

The causative agent in the production

of this disease is the bacillus bovisepticus, which is readily transmissible to other animals by experimental inoculation. The symptoms observed are of such varying character that diagnosis is usually difficult without an autopsy carefully conducted and considered. It should be borne in mind that, as in other diseases, typical cases are not always found, that is, those showing such typical lesions as are mentioned here, but if search is made, and judgment used, hemorrhagic lesions will be discovered.

Differential Diagnosis

Differential diagnosis would seem to come most frequently in Illinois between anthrax, symptomatic anthrax (blackleg), and the so-called "cornstalk disease."

The differentiation between hemorrhagic septicemia and anthrax should be made upon the history of the case, the appearance of the blood and the temperature of the affected animal. In hemorrhagic septicemia the temperature is often normal, but may rise a few hours before a fatal termination to an abnormal degree. In the White county cases already mentioned, the temperature in one was 104.6°, in the other 104.8° a few hours before death, which I neglected to state occurred in both cases, about four hours after my departure from the premises. Anthrax is characterized by a very high temperature.

In hemorrhagic septicemia the blood is normal in appearance, or perhaps, in some instances, slightly lighter in color than normal, while in anthrax it is dark, often black, not coagulating readily, and reddens upon exposure to the atmosphere. While the history of any single individual investigated might not be clear, and the facts misleading, yet the season of the year might and should be taken into consideration. For instance, anthrax usually prevails in hot, dry weather, following in many instances, not always, a wet season, and hemorrhagic septicemia prevails at all seasons, perhaps most frequently in the cooler and cold months.

The autopsy of carcasses of anthrax cases are not to be recommended as there is great danger to the operator and also great liability of scattering the infection.

The differential diagnosis between hemorrhagic septicemia and blackleg should be based upon the age of the animals in some instances, but not always, and also upon the character of the local external lesions. In the first named any age is susceptible, while in the latter, cattle over two years old are very rarely affected, the disease occurring in a large majority of cases, in thriving calves.

In hemorrhagic septicemia local tumors, if present under the skin, are usually of such slight dimensions as not to be observed before the removal of the hide, while large tumors in various parts of the body are characteristic of blackleg. The contents of blackleg tumors decompose, forming gas, which gives rise to a peculiar crackling sound upon manipulation.

Difficulties of Differential Diagnosis

The differential diagnosis, antemortem, between hemorrhagic septicemia and so-called "cornstalk disease" may present some difficulty, but a careful autopsy should prevent confusion, for in the first named the lesions are usually plain, while in the latter, the nervous system being more particularly involved, they are difficult of detection.

More errors have probably occurred in our state in the diagnosis of the disease in question, than in all others combined, and for myself, I plead guilty. In so many cases we have made an inspection of cattle dying in a stalkfield when the weather was cold and conditions for an autopsy very disagreeable, that we have, off-hand, made a diagnosis of cornstalk disease and advised removal of the cattle to another field.

The result has been favorable, usually, for the trouble stopped, but I am perfectly satisfied that if I had taken the pains to hold an autopsy in these cases, the large majority of them would have proved to be hemorrhagic septicemia. My advice to young practitioners, has always been to hold postmortem examinations of these cases, first removing the skin, and observing the condition of the subcutaneous tissue, and have assured them that they would find many cases of what is termed hemorrhagic septicemia, but most of them, like myself, don't do it.

Permit me to cite one case where cornstalk disease was diagnosed, and the lesions discovered postmortem. It was in a herd of heifers, about forty in number, which had been running on a stalk-

field from the time the corn had been gathered until they had exhausted it, when they were driven to the barn lot on a Saturday evening and there remained until Monday morning when they were placed in a small stalkfield temporarily until other arrangements could be made for them. After they had been in this field about four hours, a little son of the owner called his attention to the fact that they had lost five calves in that field the past spring. The cattle were then returned to the feed lot and the next morning several were sick and one or two dead. Upon my arrival Tuesday evening, fourteen were dead. Several autopsies were held and extremely well marked lesions of hemorrhagic septicemia were found in each case. Extensive extravasation of blood into the lungs was especially noted.

One peculiar condition which has very frequently come under my observation in these cases, is opisthotonos in the carcasses of a large number of animals.

Treatment of diseased animals appears to be unavailing, but removal of unaffected animals from the premises formerly occupied is always advisable. Prophylactic treatment has probably advanced beyond the stage of experiment and should be used after a positive diagnosis has been made.

The principal characteristic symptoms of hemorrhagic septicemia are general indisposition, stoppage of milk secretion in cows: animals with affected throats, if any appetite is present, swallow with great difficulty, or are unable to swallow: they also breathe heavily, and such cases usually have a sudden fatal termination. Occasionally, while still on their feet, delirium is present, when the affected animal may run about furiously. Stiffness in the limbs is frequently observed, and acute lameness may be present. When down they exhibit severe pain with spasms and head and neck drawn back on the body—opisthotonos.

Very rapid loss of flesh occurs in animals which do not die quickly. It is probable that the body temperature is not much guide in diagnosis, for often there may be quite prominent symptoms without much alteration in temperature, and again there may be a high temperature a few hours before death. Swellings may appear about the throat and lower extremity of the limbs. Bowel evacuations are frequently streaked with blood and sometimes there is a bloody mucous discharge from the nostrils. Bloody urine may occasionally be observed. Visible mucous membranes are sometimes congested.

Characteristic Lesions

Characteristic lesions are (the skin should be first removed before beginning autopsy): hemorrhagic areas distributed over any or most parts of the carcass, from the size of a grain of wheat to an inch or more in diameter, very rarely are they found much larger. Often extensive effusions are present in the region of the neck, shoulder or back, having the appearance of a severe contusion, produced, probably, by the coalescing of very minute hemorrhages.

A yellowish gelatinous exudate is frequently associated with these hemorrhagic areas in the subcutaneous tissue. Muscles are usually unaffected, but their sheathes may be affected. The cervical and prescapular lymph-glands, as well as those in the cavities, are sometimes edematous or hemorrhagic. In the thoracic cavity the lungs, pleura, diaphragm, pericardium, and heart wall are very frequently involved more or less seriously, and it is highly probable that a very sudden death following an illness of a day or two, is caused by extensive extravasation into the lungs. The intestines and peritoneum rarely escape hemorrhage in some locality, involving all the coats of the intestinal wall, not a real enteritis probably, but simply hemorrhagic, with infiltration into the lumen of the bowel. The kidneys often show petechial spots, as also may the bladder, and the latter may contain bloody urine. The udder may be the seat of intense extravasation.

The synovial surfaces are at times affected, which accounts for the intense lameness often present. Hemorrhages into the meninges of the cerebrum sometimes occur, which accounts for the delerium or coma.

Discussion

A. T. Kinsley: Doctor Tiffany has given a splendid description of bovine hemorrhagic septicemia, but it is unfortunate that such a report had not been forthcoming long before this to corrob-

orate the findings of other investigators. Dr. D. F. Luckey, of Missouri, instigated an investigation in 1907 of a disease in cattle that proved to be hemorrhagic septicemia, and if Doctor Tiffany's present report had been available the officials in Missouri would have had less difficulty in identifying the disease.

This disease occurs in cattle on all kinds of soil, high land and low land, regardless of drainage. It may affect cattle of any age, although it occurs most frequently in calves and yearlings. The disease may occur in native cattle, but it most commonly affects cattle that have been shipped. In some instances the disease occurs first in shipped in cattle and later affects the native cattle on the same or adjacent premises.

The specific cause of the disease is the B. bovisepticus, although some predisposition appears to favor the development of the disease, particularly the digestive and pulmonary types. This disease is fatal in from five to eighty per cent of a herd in which the disease appears. Although Doctor Tiffany has given a good description of hemorrhagic septicemia it may be of value to summarize the symptoms and lesions of this disease. Five different forms of hemorrhagic septicemia may be described: septicemic, cutaneous, digestive, pulmonic and cerebral types. The digestive and pulmonic types may be acute, subacute, or chronic. The other forms are practically always acute in character.

The septicemic type is characterized by sudden onset, marked depression, inappetence, arched back, usually a rise of from 2-4° F. in temperature, and death in from three to eighteen hours. The cutaneous form of the disease is manifested by a subcutaneous inflammatory edema, the lesion usually being located in the inferior cervical region, depression, inappetence and locomotory disturbances in some cases. Animals affected with this form of the disease usually die in from one to three days. The digestive form of hemorrhagic septicemia may be acute or chronic. The acute type is characterized by symptoms typifying an acute enteritis and the chronic form manifests symptoms typical of a severe gastro-intestinal catarrh. The chronic form of the digestive type of hemorrhagic septicemia occurs in calves in public stockyards, and is difficult to control. The pulmonic type of hemorrhagic septicemia may be acute or chronic. It is most common in calves and yearlings, although all cattle are susceptible. The acute form of the disease has a rapid onset and is manifested by chill, fever, cough, dyspnea, and usually death in from one to three days. The chronic form of the disease is manifested by cough, loss of condition, rough coat, nasal and ocular discharge of a serous, mucous, or mucopurulent material. The affected animals may ultimately become so weakened that they die of exhaustion, or they may have sufficient vitality to maintain life and recover. This form of the disease is of common occurrence in calves and yearlings that are in public stockyards or have recently been shipped.

The meningeal form of hemorrhagic septicemia is characterized by symptoms typical of cerebral and meningeal disturbances, and is usually fatal in from six to twenty-four hours.

The primary lesions of hemorrhagic septicemia are subcutaneous, subserous, and submucous hemorrhages. In the early stages the hemorrhages are petechial but by fusion they may later appear as blotches. Lymph-glands are usually tumefied and congested or hemorrhagic. The spleen may or may not be enlarged. In addition to the general lesions, the cutaneous type of the disease is characterized by a subcutaneous inflammatory edema; the digestive form by an enteritis which is usually hemorrhagic in character; the pulmonic form by an atypical croupous pneumonia in which there is a marked interstitial exudate; and the cerebral form is characterized by localized hyperemia, hemorrhage or inflammation of the brain or meninges or both the brain and meninges.

The differential diagnosis of the disease has been clearly described by Doctor Tiffany, except the distinction between the digestive type of hemorrhagic septicemia and parasitic disturbances of the digestive tube and the pulmonic type of hemorrhagic septicemia and parasitic pneumonia. Parasitic disturbance of the digestive tube can usually be identified by examination of the fecal matter. Parasitic pneumonia is characterized by a paroxysmal wheezing cough.

Hemorrhagic septicemia can be prevented by immunization.

(Discussion to be continued in next issue.)

Veterinary Service in the First Lines at the Commencement of the Campaign

By F. HOGARD, Veterinary-Major of the Second Reserves Colonial Troops

Translated from the French by Major Wm. P. Hill, U. S. A.

SINCE I have been attached, in October, 1914, to the ....th colonial artillery regiment, beyond the general daily routine I have had to deal with cases which may be classed in the following three groups:

1. Wounds received in battle.
2. Cutaneous diseases, parasitic or otherwise.
3. Affections of the lower extremity of the legs resulting from irritation.

In this article, I shall consider only wounds received in war, and make a few observations which have occurred to me concerning the hasty surgical methods which I have adopted, and the results obtained.

After the battle of the Aisne toward the end of September, 1914, our troops held a particularly dangerous line where for months the fighting was extremely bitter and relentless and where they were obliged to remain under intense artillery fire. Everyday, the enemy poured down on us a deluge of metal, often without method, but always on a "kolossal" scale.

Sometimes he was searching for our *echelons* (in the artillery this means the important park which comprises the drivers, horses and all the accessory material not forming part of what is called the field battery, which, when in position, is composed of guns and caissons), and he put such energy into this search that although not locating them with precision he often caused us heavy losses.

For example: The .... October, 4 killed, 17 wounded, 62 wounds; the .... November, 9 killed, 23 wounded, 107 wounds; the .... November, 4 killed, 35 wounded, 93 wounds, etc., etc.

In this terrible part of the line where the soil was denuded, offering no particular natural shelter and the fairly low slopes only imperfectly protecting us from the hostile artillery fire, it became indispensable for our guns to be as near as possible to our infantry lines and also for the horses to be as near the guns as possible.

Nearly all the troops took shelter in improvised sheds erected on the slopes of a modest hillock; sheds with walls of earth and refuse, with roofs of straw, hay or sheaves of wheat which had been left in the fields from the last harvest.

Undoubtedly these shelters were sufficient for the health of the animals. However, they did not prevent casualties when the fire was accurate.

Moreover, all day long, and at night time, a fairly large number of troops were obliged to move about on various missions in connection with the service; and they always ran the risk of being hit by stray shells, which unfortunately caused many casualties.

In fact, never a day passed without a casualty, and besides any member of the equine population that was wounded—horses attached to the infantry, brigade staff, machine gun section, engineers, liaison agents or passing horses—were sent to me for treatment.

Line of Action Formulated

At the very first, I made the following resolutions: that I would employ all my activity and all my experience in remedying such a situation.

I would abandon the all too simple method hitherto employed, i. e., slaughter in cases of small gravity, indifference, or superficial care for mild cases, and I would intervene in a rational, methodical, scientific and economical manner in all cases where a cure seemed possible, and if a complete cure was not possible, I would endeavor at least to save the subject so that it could be utilized in some way.

I would satisfy my conscience, I would serve my country to the best of my ability and I would do my utmost for my good friend, the horse, which suffers like us, because of us, and for us.

Furthermore, in the eyes of the war-

riors with whom I associated, I would raise to the highest possible level the flag of the veterinary profession.

Time, that powerful auxiliary to soldiers, would certainly be on my side. After having gained an incomparable victory, the French troops were stopped by the enemy's trenches; fortress warfare had started and it seemed likely that the war would be of long duration. I made up my mind as to the method I would employ—I determined to intervene immediately.

I had before been attached to the sanitary service formation of my army corps which I had organized during the mobilization, and it was with one of them that I had served during the whole of the open warfare period.

I had picked up many wounded on the battlefield. I had observed many others, either at the dressing stations or at the ambulances. I had seen, I had reflected, and I had formed the following opinion:

If, in the case of a man, when wounds are believed to be aseptic, one must be content to maintain them as such—by an individual dressing at first, then by a dressing of tincture of iodin—until they can be treated at an ambulance or hospital with all surgical skill and proper aseptics, one could hardly support a like argument for the horse and lay down the same rules as for the medical treatment of men.

Every shell splinter, every bullet, every piece of shrapnel, should they be aseptic when touching the skin, form, when penetrating the tissues, a sort of cap formed of an agglomeration of hair and dermo-epidermic debris, which, themselves septic, penetrate a certain depth into the thick muscular masses surrounding the bones, and become a center for extremely violent infection of the most dangerous nature and against which, after two or three days, frequently nothing can be done.

Local superficial disinfection, and evacuation to the rear—impossible to effect at the time of which I speak—was, I believed, insufficient treatment and did not receive encouragement from me.

It was only likely to hinder cicatrization, and favor fistulization, abundant suppuration, and very often septic complications causing death or necessitating the immediate slaughter of the animal.

It was likely to reduce my effectiveness in large measure, and cause the loss of the professional reputation I enjoyed, a reputation which encouraged me to hold out physically and morally in the midst of winter in one of the most terrible sectors of the front.

Simple logic demanded that as soon as possible after the accident, not only should the projectile be extracted from the wound, in other words that, wherever possible, foreign substances should be taken out of the tissues, the septic site for the spread of the infection, and that afterward antiseptics be injected to the bottom of the wound.

For this, it was necessary to make an incision, open the wound, sometimes liberally, often very deeply, examine very closely, practice counter-openings, drain large surfaces and for several days give minute antiseptic treatment.

Was it possible for us under the difficult conditions in which we were placed to attempt these interventions with any chance of success? I thought so, and results have proved that I was right.

Confronted by Deplorable Conditions

We were living under artillery fire, in an open field, in our dugouts, covered with mud, and very, very dirty.

Water for our antiseptic solutions and for our personal use was bad, to say the least. Our instruments and our hands could not, therefore, be aseptic.

Moreover I had only one very modest scalpel, one pair of tooth pincers, one pair of curved scissors, also a sounder —although this was not reliable.

Neither had I much in the way of bandaging material, which the numerous cutaneous quittors of disquieting dimensions would easily have absorbed, even had there been four or five times the quantity.

As antiseptics, I possessed only small quantities of the incomparable cresyl and tincture of iodin, and sublimate which I begged of every comrade who had left for the war fully equipped with photographic material.

I had no means of control, merely a twitch. No competent assistants, only some N. C. O.'s, 20 years old, whom it was necessary to instruct in every detail but who immediately offered their services and faithfully served me.

There was no proper shed. I was always obliged to operate and do the dressing in the open, no matter if it rained all day or if the shells were dropping around us—never a clean or a dry piece of ground.

It was also impossible to isolate the subjects on which I had to operate and which I was obliged to leave in the ranks, thus occasioning a herding together and an uncleanliness which cannot be imagined unless one has passed through a winter campaign at the front.

There was no serum either against tetanus or septicemia; and I was fully aware—from what I saw as regards the men—that the ground was infested with mediums for these two diseases.

Never did a surgeon find himself in such deplorable conditions. And what was even sadder was the knowledge that it would take a long time before these conditions improved.

These conditions were imposed on us by this terrible war, by our close proximity to the enemy; *by lack of preparedness in time of peace*, etc., all of which could not be quickly transformed.

What was to be done?

Knowing the pitiful results of the old method I did not hesitate to intervene. If an accident occurred, it could not be more disastrous. The usual infections—operative or postoperative—which would add themselves to that already existing and which would reveal themselves by abundant suppuration, I could easily master. It was a question of surgical skill—aspiration of secretions—it was also a question of professional probity, of care, antisepsis, etc.

But by intervening as much as possible, lancing as deeply as possible, opening the wound, depositing antiseptics at once at the bottom of the wound, and in allowing the air to penetrate freely into the hole, I could prevent the germs of these affections from multiplying to any extent.

The uselessnes of my intervention? In cases where it would be materially impossible for me to extract the foreign substance and obtain a complete cure—lesion of the bone tissues, cartilaginous, tendinous—even in such cases the advantage would be enormous. The animal would live. I would have preserved it from septic complications and perhaps, someday, with exercise and the movement of the projectile aiding, I might be able to extract it.

I was encouraged to work on these lines by my chief, M. le Veterinaire Principal B—and I take this opportunity of expressing to him my deep gratitude for the confidence he has placed in me and also desire to thank him for his unceasing efforts in endeavoring to supply me with indispensable material.

Fistulae Respond to Treatment

As the colonel of the regiment and my group chief, to whom I had expressed my views, were also favorably disposed, I lost no time commencing my activities on old wounded subjects suffering from fistula, abundantly suppurative for a long time, some of them as long as two months.

I incised the wounds rather deeply so as to get to the foreign substance, and I must admit, that at the bottom of a canal having organic walls, surrounded with a fibrous sheath, it was often difficult to touch it with the finger; to enucleate it and extract it, was still more difficult.

When I was able to extract the projectile, the fistula disappeared at once and the operative wound healed completely, and without the least trouble.

I was thus able to extract from quite a number of animals, shell splinters, bullets and pieces of shrapnel which they had carried for a month, even two months, and easily obtain a complete cure.

More delicate and also much easier is the search for a foreign substance shortly after its penetration.

It was on the morning of October 29, that for the first time I intervened under these conditions.

The evening before, at nightfall, the enemy had shelled our 120-caliber *echelons* with shells. Four horses were killed, seventeen were wounded, 47 wounds in all, but on careful examination the next day, this number was increased to 62.

Generally speaking, the wounds were slight. Many of them seemed painless, and as if cut out with a rather large punch. I was told that the force of the

120-caliber explosive was so great that it broke the casing into a considerable number of small splinters which had riddled our horses, and that it was owing to this extraordinary force causing these numerous splinters, that the wounds were not more serious.

As a matter of fact, the exterior aspect of these wounds failed to indicate the state of decay, sometimes considerable, which existed more or less in all of them.

The first opening of the wounds was a revelation to me and confirmed my opinion that this putrefaction could only be suitably cured by an appropriate and immediate treatment.

I gave myself up soul and body to this treatment and was largely rewarded by the results obtained.

I at first supposed that the projectiles were generally of large dimensions, but the holes it made (4, 5, 6 millimeters in diameter), proved that it was small.

Furthermore, it seemed to me that in most cases it had traversed the skin with such force and such speed that, in the muscular masses, it had continued its trajectory in a straight line, and that it would be necessary to look for it in the direction it had taken when first striking the animal. No greater mistake could have been made. Nearly always, after having penetrated the skin and progressed a little it had lost its rectilinear movement, zigzagged a little distance, and made a cavity which was filled with motley debris, organic juices, blood, and when it stopped zigzagging, it became buried in areas which varied, and from which I was usually able to extract it. To do so I opened the wound liberally.

From a surgical point of view, it only remained for me to enlarge the opening and extract the projectile—counter-opening, if possible, drainage, incision, declining, etc.

I would greatly enlarge the opening, sponge with tincture of iodin, and cover up with any old pieces of linen such as shirts, drawers, etc., sterilized by being plunged into a strong solution of cresyl.

Twice, thrice or four times a day at the beginning, according to the necessity, I renewed this treatment.

The defensive reaction, the elimination reaction was soon produced, but not without frequent local septic phenomena, phenomena which were always local and which were not long in retrogressing—large tumefaction, yellow oozing, sui generis odor, etc.

I thereupon worked with renewed energy and little by little all these phenomena disappeared. Abundant suppuration was established and cicatrization was effected.

The cure was often very rapid, and I was always able to foretell that such would be the case if the wound was merely muscular and if the foreign substance was extracted and the wound opened up well.

I might have hoped for cures in many other cases if the shell splinter, freed from dirt, had penetrated deeper and had encysted itself.

End-Results Good

Of the 17 horses referred to above, 47 wounds were operated on at once and 15 others, hidden by hair, were also operated on after thirty-six to forty-eight hours. All 17 horses lived; 13 were completely cured. Four wounds only remained fistular which, however, did not prevent the animals from being utilized.

Among the subjects more seriously wounded, I might cite the following:

40297. Chestnut mare: two wounds right buttocks, two at the withers, one at the left side of the neck and shoulders.

39212. Chestnut horse: one wound at the right thigh, large wound at left buttocks, deep neck wound.

41702. Gray mare: four wounds right buttock, one wound left buttock near the walls of the pelvis, a sixth at the withers, a seventh at the left shoulder. The fistula of the withers remained a long time, then disappeared.

1007. Chestnut mare: wounds on the upper side of the neck and shoulders endangering the cervical ligament and cord.

1894. Bay mare: three wounds on the left side, one wound right forelock, paralysis of the radial. The piece of shell was found next to the radius.

33002. Black horse: deep wound right buttocks. The piece of shell stopped at the upright branch of the ilium. The decomposition was considerable so that removal by incision was simple.

40959. Bay horse: large wound upper part of the loins and hollow of the flank, another wound at the left shoulder.

21463. Bay horse: one wound on the

outer surface of the shank (right leg), the whole thickness of same being affected and nearly the entire width of the anterior extensor of the phalanx. There was abundant suppuration and the subject became emaciated.

In these particular cases, the results had exceeded the most optimistic hopes and agreeably surprised the commander, whose support I could hereafter still further rely on.

Treatment of Shrapnel Wounds

In the meantime other series of cases occupied my attention, some identical, some different. Among the latter I will merely mention one, the first case that I dealt with which can be taken as a type of many—animals wounded by shrapnel.

The ..... November the enemy was shelling our echelons, and the firing was so accurate that I saw with my own eyes shells bursting above a row of horses.

In less than an hour I saw 17 horses fall: 5 were killed; 6 were so seriously wounded that they soon succumbed; 6 afterwards got up.

In all, 35 were more or less wounded, with a total of 93 wounds. The shelling occurred at nightfall and I could not deal with the cases until the next day.

This time the lesions were absolutely different from those I have previously described. Generally speaking, the wounds were restricted to penetrating lesions, with perforation of the tissues only, having at the bottom in some cases, a considerable amount of debris of tissues, bones and tendons.

The shrapnel had progressed into the organism until stopped in its course, either normally, its speed being exhausted, or by some resisting object, the skin itself very often.

Numbers of shrapnel are stopped at skin depth and a simple cut of the lancet suffices to eliminate them.

But even in these simple cases in order to avoid septic complications and be certain of effecting a cure, it is necessary to open liberally the orifice made by the piece of shrapnel and minutely disinfect it; above all, it is necessary to extract the small agglomeration of hair. This applies even more so when the projectile is deeply embedded and can be revealed only by palpation.

Often the dirty projectile had entered a musculo-aponeurotic region, depositing germs which would soon have caused violent inflammation, and abundant suppuration would have set in, bringing about irremedial disorders. I forestalled these accidents by immediately intervening as deeply as possible and extracting the projectile, if at all possible.

Sometimes I extracted it from its culde-sac by a surgical opening, but often if I were able to discover it externally—and when the region lent itself to it—I took it out by a simple incision of the tissues which covered it. If the region was a dangerous one, large vessels, nerve-trunk, articulation, spanchnic area, etc., I waited and then if the projectile was aseptic and became encysted, or if it was septic and caused abundant suppuration, with daily fluctuation, I merely had to puncture and take it out.

When a projectile struck a hard organ and I had reason to believe that the latter had been reached, I did not hesitate to remove it by incising right up to it—at least, if it was not too deeply embedded: head of the bones, cervical vertebrae, arteries, etc.

I always proceeded to ablation of the fractured parts. But in these cases, very often the bony cicatrization remained, without becoming fistulous.

Undoubtedly intervention is not always absolutely necessary, and infection does not always appear, inasmuch as in many cases a number of penetrating wounds are not even suspected. They heal of their own accord and their presence is only guessed at later when palpation reveals the foreign substance.

My opinion, however, is that it is best to act at once in all cases where wounds are evident, and not to count too much on immediate cicatrization, which is really only exceptional.

Of the 35 horses which I treated at this time, 30 were cured in a relatively short time, i. e., from two to four weeks.

Five suffering from fistula needed a longer treatment.

Among the most seriously wounded and those that I cured, I mention the following:

Pain. Bay horse: one wound in the left surface of the neck and shoulders, another wound in the lumbar region. Four wounds in the right buttocks and

paralysis of the femoral. The subject was cured in one month of its wounds and in less than two months of its paralysis. Subsequently the animal was killed by a "77" shell.

Loulou. Bay horse: one wound left thigh. The projectile traversed this region from the bottom, inside and outside, stopped at the hock, and caused very abundant suppuration.

22378. Black mare: wound at the right surface of the neck, endangering the cervical column. Numerous sequestra were removed. One wound at the outer surface of the left breast. Two shell splinters of the size of a two franc piece were removed from the humerus.

17283. Chestnut mare: one wound left shoulder, perforation of the scapula. The projectile was not extracted. One wound outer surface of the left breast, the projectile passed round the bone and enucleated itself at the back of the vein of the foreleg.

23427. Chestnut horse: one wound of the olecranon process. The projectile was found between the two sides. One wound on right surface of the neck which was ripped open by a large piece of shell which was easily extracted from the cervical ligament.

In the foregoing series, complete success was nearly always obtained; but I had to overcome many difficulties resulting from the large number of wounds, their depth and the diversity of the wounds.

Moreover, as 93 new wounds had to be treated, apart from those already under my care, my resources as regards materials and bandages were extremely limited.

On several occasions, I had to intervene in cases where the wound was particularly dangerous, occasioned by percussion shells which, bursting underneath the horse, riddled it from top to bottom with bullets or splinters, many of which perforated the thoracic and abdominal cavities, causing death.

In two cases the wounds were not fatal, but I was unable to cure them owing to the situation of the projectiles, i. e., lower surface of the trunk.

Generally speaking, the "77" shells—fusée or percussion, and the "120" shells were our daily food; but often we received stray "105" shells, or even "155's" by rounds of four at a time, every five minutes for half an hour and sometimes for two and three hours; occasionally we were shelled with "210's."

In these latter cases, however, the wounds were so hideous that death was either instantaneous, or it became necessary to put the subjects out of their misery.

Sometimes a few subjects survived and it was justifiable to attempt treatment in view of an eventual cure being obtained.

General Results

In four months, out of a total of more than 200 subjects, I treated approximately 700 wounds.

Fifteen horses died while under treatment: subjects which were old, worn out, struck in several places and unable to stand up, some wounded in the head and not able to take food, some succumbing to pleurisy, peritonitis, unsuspected perforation of the rectum, etc.

Twenty horses at the maximum were left with one or more fistulae which, however, did not prevent them from being used.

There was not a single case of septicemia. There was one case of tetanus, the subject carrying a projectile not at first suspected, which I afterwards discovered in the middle of a deep and abundant purulent mass in the region of the breast. There was also an Anglo-Norman horse, whose tetanic state had almost completely disappeared, but who on the very day when I thought him cured, was killed from the shock of a shell which burst within 2 meters of him, without, however, wounding him.

Taking into account the serious handicap under which I was placed, and the meager facilities I had at my disposal, it must be admitted that the results obtained were very satisfactory, and the following conclusion should be borne in mind if only from an economic point of view:

1. For veterinary surgery in war time to be effective and economical, it must be practised immediately.

2. It is easy and does not really call for other means than those at one's disposal in the front lines.

Some of the Operative Steps in the Removal of the Ovaries of the Bitch

By J. P. FOSTER, M. S., M. D. V., Rochester, Minn.
Mayo Clinic

THE operation for the surgical removal of the ovaries has been given a variety of names. Among the terms applied to the procedure by writers on canine surgery are: "castration of the bitch," "ablation of the ovaries," "ovariotomy," "ovariectomy," and "oöphorectomy." When the entire uterus, or the greater part of it, is removed with the ovaries, the terms "ovaro-hysterotomy," "ovaro-hysterectomy," "hystero-ovariotomy," "hystero-ovariectomy," "hystero-oöphorectomy," "hystero-oöthecectomy" have been employed. "Spaying" is a term applied rather indiscriminately to either of the procedures just mentioned.

As the terminology differs, so differs also the choice in the location of the laparotomy incision. Since this is a very important point, it is worthy of some discussion. Five different textbooks on canine surgery have as many different suggestions for the location of the laparotomy incision. They are as follows: "An incision made in the linea alba at the umbilicus, with a sharp-pointed bistoury, cutting toward the diaphragm"—"The incision extends across the umbilicus"—"The incision should be made slightly to either side of the linea alba, and immediately posterior to the umbilicus"—"An incision is made in the median line midway between the umbilicus and the pubis"—"The incision is made immediately in front of the pubis, and extends forward." Therefore, according to these authorities, the operator is offered a wide range in the selection of the site for the incision. In addition to the three intermediate possibilities offered, he may begin as far forward, as just anterior to the umbilicus, or as far backward, as just anterior to the pubis. The length of the incision recommended varies from one "just large enough to freely admit the index-finger," to one "two inches in length, or longer if necessary.

Each of the locations mentioned as desirable for the laparotomy incision has its advantages, as well as its disadvantages. When the ovaries are once *located,* it is much easier to draw them out through an incision that is made well forward. On the other hand, the farther forward the incision, the more difficult it is to locate the uterine horns. For this reason, operators who rely upon first picking up the uterine horns as guides, and then following them forward to the ovaries, do not recommend an incision anterior to the umbilicus. The other extreme—an incision just in front of the pubis—renders the location of the uterus and its horns comparatively easy, but in a mature animal, especially if long bodied, great difficulty is likely to be encountered in drawing the ovaries back through an incision located so far posteriorly. The only means of correcting this difficulty is either to extend the incision far enough forward, so that the ovaries can be brought outside the abdominal cavity—in order that suitable hemostasis may be applied to their attachments—or, to assume the risk of rupturing these attachments by inserting the index-finger far forward into the peritoneal cavity, and then, by scraping the tissues with the finger nail, finally rupturing them. Neither of these procedures may be considered good surgery: In the one, too long an incision is necessary to secure the ovaries and provide for appropriate hemostasis—in the other, no adequate method is provided for controlling the hemorrhage that is very apt to follow the intra-abdominal method of rupturing the ovarian attachments, especially in adult animals.

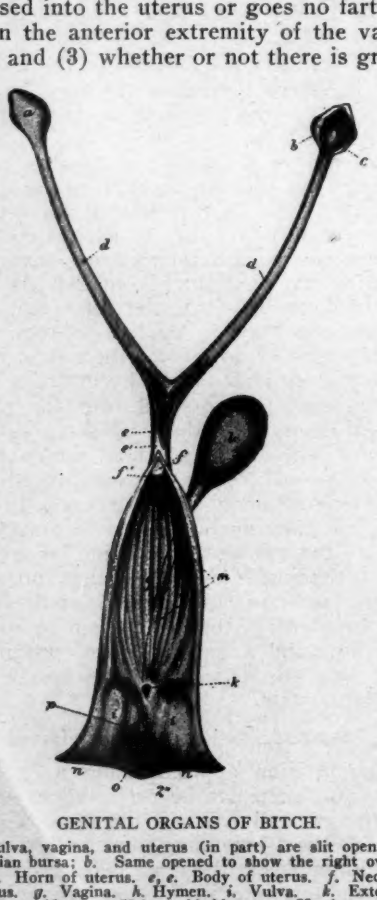
Medium-Sized Incision Preferred

An incision approximating a "happy medium" seems to be preferred by most operators, and I am of the opinion that the incision beginning just posterior to the umbilicus is the most logical location for the opening in the mature animal. Little difficulty is experienced in locating the horns at this point, and ordinarily the incision need not be more than an

inch in length. The ovaries can be drawn out through the opening, and appropriate hemostasis applied to their attachments, without undue tension upon the horns. If the incision is well dilated, the intestines comparatively empty, and a good light obtainable, it often is possible to pick up and draw out the horns with a small hook, thereby making it unnecessary to insert the finger through the laparotomy incision.

Important Points in Use of Sound

The next points to be considered are: (1) whether or not the use of a sound for the purpose of facilitating the location of the uterus is permissible; (2) whether in the majority of cases the sound is passed into the uterus or goes no farther than the anterior extremity of the vagina; and (3) whether or not there is great danger of passing it into the bladder. Some authorities deprecate the use of a sound, and refer to its employment as "unwarranted," "practiced only by the novice," and "bunglesome." The following quotations are taken from textbooks on canine surgery: (1) "Some operators believe the uterus may be more easily distinguished by first introducing a probe, catheter, or sound into the fundus of the organ by way of the vagina. This is an amateurish method and hinders rather than expedites the operation." (2) "Some operators introduce a sound into the uterus previous to the operation, but this as a rule is unnecessary, as familiarity with anatomy will easily detect the difference between the intestine and the fallopian tubes." Commenting on the second quotation, which is from a prominent German authority, it would seem that there could be no possibility of mistaking the intestine for a fallopian tube, since the diameter of the small intestine, by actual measurement in the same individual is from sixteen to twenty times as great as that of the fallopian tube in a normal condition. No doubt the author intended to refer to the uterine horns, and not to the fallopian tubes. Unless it can be shown that damage is done to the parts through the introduction of the sound, I fail to understand why any valid objection should be made to the practice. Any procedure that will facilitate and make positive the absolute location of an organ, or part, should not be discouraged, and may well be practiced as a routine measure even by the most skilled operators.



GENITAL ORGANS OF BITCH.

Vulva, vagina, and uterus (in part) are slit open. *a.* ovarian bursa; *b.* Same opened to show the right ovary. *c.dd.* Horn of uterus. *e, e.* Body of uterus. *f.* Neck of uterus. *g.* Vagina. *h.* Hymen. *i.* Vulva. *k.* External urethra orifice. *l.* Urinary bladder. *m.* Urethra. *n, n.* Labia Vulvae. *o.* Fossa clitoridis. *p.* Central projection of fold of mucous membrane which conceals the clitoris. (After Ellenberger, in Leisering's Atlas.)—*Sisson's Anatomy.*

For years, I was of the opinion that a sound passed into the vagina went on through the cervix into the uterus. Textbooks referred to "introducing a sound into the uterus" (see preceding paragraph) and without giving the matter much serious thought, or studying the anatomy of the parts, I accepted the idea without question. During the past few years I have tried to pass a straight sound, with a rounded head three millimeters in diameter (about the size of a match head), through the cervices of several hundred bitches, both living and dead. As I was fearful of possible puncture of the anterior wall of the vagina, this was the smallest sized sound I considered it safe to use. Except in the

cases of a very few large mature animals, I have never been able to pass this sound into the uterus.

Whenever the occasion has presented itself during the past year, I have tried the following experiment on bitches that have died from various causes in the laboratory: First, the abdominal viscera are exposed by an incision made through the linea alba, extending from the xiphoid cartilage to the pubis. The sound mentioned is then inserted in the vagina until it contacts the cervix. With the fingers of the left hand, the uterus and vagina are brought up into the field, and while the sound—directed by the right hand—is gently pushed and rotated against the opening of the cervical canal, manipulation of the vaginal wall surrounding the head of the sound is made—with the fingers of the left hand—in an attempt to work the end of the instrument into the external os. Usually the attempt has failed. As may be noted in the diagram reproduced from "The Anatomy of the Domestic Animals," by Sisson, shown herewith, the intravaginal part of the cervix in the bitch is well marked, and projects backward into the vagina not unlike the cervix of the mare, except that dorsally it is continuous with the roof of the vagina, which produces a break in what otherwise would constitute an annular space surrounding the structure. Few practitioners would think of attempting to pass a sound of any size into the vagina of a mare and expect it to proceed unaided through the cervical canal into the uterus. It would not be reasonable to suppose that a sound with a shaft, sav, one-half inch in diameter and possessing a head the size of a hen egg, would enter the cervix of a mare, unless the hand was first inserted in the vagina, the cervix dilated, and the end of the sound carefully guided into the external os by the fingers. By simply inserting the sound in the vulva, and then pushing it forward, we would expect the end of the instrument to pass to the side of the cervix instead of into the cervical canal, and come to a stop in the annular space surrounding the base of the structure. This is exactly what happens in the majority of instances when a sound is inserted into the vagina of the bitch, as is easily demonstrable on the dead animal. The uterus is located without difficulty, however, when the end of the sound is in the anterior extremity of the vagina.

There is little danger of passing the sound into the external urethral orifice in the bitch. This orifice is so situated on the pelvic floor, just anterior to the ischial arch, that unless the sound is bent to a certain angle, it is very difficult to effect an entrance into the bladder. In experimental laboratories where it is necessary to practice catherterization extensively, a vaginal speculum is first introduced, and then so manipulated that the external urethral orifice is drawn backward and downward over the edge of the ischial arch, where it can be seen, and the catheter inserted.

References to the location and length of the laparotomy incision in this article apply to *adult* animals. An operation for the removal of the ovaries and uterus of the puppy, calls for a laparotomy incision which may be determined by a method I have already described.[1]

[1]Foster, J. P., Ovaro-hysterectomy of the puppy. Am. Jour. of Vet. Med. 1918, XIII, 313-317.

COL. L. A. MERILLAT

Unanimously elected President of the Illinois Veterinary Medical Association at its recent meeting in Chicago.

Retention of Fetal Membranes in the Bovine*

By SILAS KEMPF, M. D. C., Roanoke, Ill.

WITH the rapidly increasing interest in pure-bred cattle and their unusual high value, coupled with the comparatively recent knowledge that the retention of the fetal membranes is so frequently associated with contagious abortion, unusual interest has been shown in the past few years in the treatment of this common and rather serious condition.

As with any subject that suddenly becomes of widespread interest it is to be expected that for a time at least, there would be varied opinions as to the best methods of handling, until such a time as experiences have become crystallized.

One may read in veterinary journals and agricultural periodicals today, many articles touching on this subject, and the opinions of these writers are so varied that they remind one of the six blind men of Hindustan who went to see the elephant; and it is not an unjust criticism to say that some of the articles read as if they were written by men who have never been unfortunate enough to soil either their linen or their hands by the lasting extracts of a decaying placenta, but rather are written on the basis of what they have heard or read, embellished with their own theories.

It is unfortunate that few veterinarians who have had extensive experience with this trouble have the courage or the time to write much for publication, for if we could get the opinions and experiences of these men it would aid materially in determining the most satisfactory way or ways of handling retained placenta, with our present knowledge.

General Rules for Treatment

There are some rules, however, that it is well to keep in mind during what might be termed this transition period. One is that a method which may work well in one locality or with a certain class of cattle may not be applicable to another locality or another class of cattle. For instance, in a sparsely settled community where only small herds of ordinary grade cattle are kept and where dairying could not be looked upon as an industry, it is reasonable to suppose that veterinary practitioners would not be numerous, but rather that a single veterinarian would take care of a wide area of country. In such localities it would not be feasible in most instances, for a veterinarian to make repeated visits in giving attention to an animal in which the membranes have been retained, the small value of the animal, and the expense incurred in long trips making it prohibitive.

Fortunately there is a class of animals that will stand what might be termed severe and crude handling, and if reasonable cleanliness and care is practiced, the manual removal of the membranes is feasible and the most practical thing to do.

On the other hand, in a community where pure-bred or high-grade cattle are kept and where veterinary service and skilled attendance are easily available, the manual removal of the membranes that are positively adherent is dangerous and bad practice.

It matters not how skilled a man may be at this work or how clean his technic, if he is dealing with a case of an infected uterus with the resultant cotolydonitis and placentitis in a pure-bred animal, particularly in heifers or aged cows, and force is used so as to rupture the cotolydon capillaries, thereby allowing rapid absorption of the infected content of the uterus, he may supplement any other treatment that he fancies but he will find in the majority of these cases that his patient will develop a temperature in from twenty-four to forty-eight hours, loss of appetite, suppression of the milk flow, great depression and possibly more or less abdominal pain. The subsequent termination will be determined more by the constitution of the animal than by the skill of any veterinarian or any or all the drugs in the pharmacopeia.

If the injury to the uterus has been comparatively slight and the absorption of infection moderate the puerperal septicemia thus caused may be held in check by the animal body, the temperature drops and the appetite returns in a few days, even a moderate milk flow may return. But if Nature does not come to the rescue, and puerperal septicemia progresses, the animal's flesh literally melts from her body;

*Paper read at the Ill. State Veterinary Assn. meeting, Chicago, Dec. 4-6, 1918.

she stubbornly refuses to touch a bit of food, great prostration overtakes her and death is the result in from four days to two weeks, and it will take no expert to determine at the postmortem that acute metritis has led to a most diffuse septicemia.

Every effort should be made by men who have had experience in this work to send this information broadcast and so save our valuable herds from what may be the well meaning but disastrous work of those who are not informed of these dangers.

Hot Saline Douche Favored

If we are not to remove the membranes by manual manipulation, the subject naturally leads to the question, "What methods are we to practice?" Here again is where we meet varied advice and opinions. Some will advise leaving the membranes alone; another, the hydro-method; another, medicated oil; another, six to eight ounces of sugar in the uterus daily; still others, capsules of iodoform. But I think it safe to state that the majority of men of experience favor the frequent douching of the uterus with hot saline solution.

As to the advice to leave the membranes alone; such advice is too ridiculous and preposterous to be discussed, as it is contrary to our knowledge of simplest surgery, to leave a putrefying mass in an undrained cavity.

As to the hydro-method; theoretically it is splendid. It has not given the universal satisfaction in my hands that I would wish; however this should not mitigate against the principle. Those who are using it successfully should advocate it in the most positive terms and teach us who are failing why we are failing.

Iodoform capsules have failed miserably in our hands. As to oils and sugar, our experience with them is too limited to either commend or condemn them, consequently hot saline solutions are the present acceptable treatments, repeated at intervals as the case may demand.

The use of a return flow catheter is the most essential instrument of choice here, as it can be manipulated from without and with the right hand within the rectum, the uterus can be gently massaged, facilitating the removal of its contents.

When this subject was allotted to me for discussion, I felt the need of assistance in its preparation, and I appealed to our worthy honorary member of Goshen, New York, Dr. J. F. De Vine, to whom all credit is due for the merits of this paper.

The Intradermic Mallein Test*

Description

THE injection of mallein into the skin of the eyelid is the only method of injecting mallein authorized, and is known as the intradermic mallein test. It has been approved as an official test for glanders in the United States Army. It is not new, as it has been in general use by our Allies during the present war. It has been used exclusively in our service overseas. All veterinary officers should acquaint themselves fully with this test before embarking for foreign service.

Syringes, Needles and Mallein

A special syringe of the Luhr type with glass barrel and colored glass piston and of either one-half or one c. c. capacity graduated in tenths of a c. c., holding 5 or 10 doses, respectively, has been adopted for making the injection. The syringe is fitted with a slip needle of 25-gauge diameter and approximately one-quarter of an inch long. The syringe and needles are sterilized by boiling. The needles should be kept in absolute alcohol when not in use.

Needles should be immersed in alcohol after each injection. For this purpose a two-ounce graduate, in which is placed a pledget of cotton and an ounce of alcohol, has been found convenient. The syringe is placed in the graduate with the needle attached and imbedded in the cotton until required by the operator. Three syringes should be provided when many animals are to be tested. Each syringe should be returned as soon as used to the graduate as described above and a clean one used for the next injection. Should

*Circular letter No. 30, War Department, Office of the Surgeon General, Washington.

animals with communicable diseases be tested, the syringe and needle must be sterilized by boiling after using, in each case. A basin of mild antiseptic solution (liquor cresolis comp., 0.5 of 1 per cent) and a clean dry towel should be available for washing and drying the hands.

The dose is one-tenth of a c. c. Ophthalmic mallein is not to be used for intradermic testing, nor intradermic mallein for ophthalmic testing. Considerable quantities of ophthalmic mallein on hand at any station will be turned back to the medical supply officer, after the adoption of the intradermic test.

Testing Animals Using Chute

When testing animals in a corral, a straight chute, holding twelve or more animals, permits of the most rapid and accurate work. The chute should not be over twenty-eight inches in width—strongly built to prevent spreading at the top, with no overhead posts or braces. There should be no wide cracks on either side of the chute. Both sides should be 4.5 to 5 feet in height. Entrance and exit gates or bars with intermediate bars for every animal are needed and the "run-board" on which the operator stands should be 2.5 to 3 feet wide and not over 12 or 14 inches from the ground. The holding pen at the entrance to the chute should be long and narrow to prevent the animals running in a circle or milling at the time they enter the chute. This pen should not hold more than 50 animals.

Animals should pass into the chute from right to left. Bars are put in place behind every second or third animal and behind and in front of each one that is refractory.

On a chute holding twelve animals, one veterinary officer with three good assistants can work to the best advantage. Two assistants should hold the animals and the other should carry the mallein, fill syringes, etc. Plenty of extra men must be provided to fill the corrals promptly, handle the bars, etc.

The assistants should draw the animal's head well over the top rail of the chute. He can pass his left arm over the animal's nose and seize the lower jaw, or he may place the left hand on its nose. At the same time he holds the ear with the other hand and pinches it so as to distract the attention of the animal while the injection is made. Some must be restrained by a twitch. It may be necessary to place a vicious animal in stocks.

The injection is made by a veterinary officer *into the dermis* of the lower lid of the eye about one-quarter of an inch from the margin and midway between the inner and outer canthus and parallel with the lid. The syringe, filled and fitted with a *sharp* needle, is held firmly in the right hand, between the thumb and tips of the middle fingers, leaving the index-finger free to operate the plunger.

With the left hand encircle the right eye with the thumb and fingers, drawing down tightly the skin of the lower lid with the thumb, allowing the fingers of the hand to be free other than to act as a covering for the eye. With the syringe in the right hand, the back of which is resting against the head of the animal in order to follow any movement, the needle may be introduced into the skin from before backward and parallel with the margin of the lower lid. The free index finger of the right hand is then placed on the end of the plunger and one-tenth of a c. c. is injected. As the mallein is injected, a small elongated swelling within the skin is seen, which insures that the injection has been made into the dermis and not subdermally. The injection may be made in either eye. The relative position of the operator, assistant and animal are the same. If the injection is to be made in the left eye, the right hand of the operator is passed under the left arm of the assistant and the needle inserted toward the median line at the same point indicated above.

Testing Animals Using Halter

In testing animals on the halter, one veterinary officer and six assistants can work to the best advantage. The work can be done as expeditiously with quiet animals on a halter as when passed through the chute.

The animal should be placed facing good light on ground lower than the operator. It may be stood in the gutter. The assistant should place a twitch on the animal and hold him securely from the near side. With six assistants, one man can keep a record of the animals, carry the mallein and fill the syringe. The other five men should get animals in

position and return them to the stable after the injection. Ordinarily, more than one assistant for holding each animal is unnecessary and in the way of the operator.

Reactions

A small "puffy" non-sensitive swelling is seen in practically all animals in from two to three hours after injection, and it remains in a few cases for twenty-four hours, more rarely for forty-eight hours. This swelling should not be confused with the typical swelling of a positive reaction.

A positive reaction will be indicated at forty to forty-eight hours by a marked swelling and edematous infiltration of the skin and underlying tissues, both lids usually being involved and nearly or completely closing the eye. On some animals the edema will be observed to have extended downward along the side of the face. The swellings are usually hot, hypersensitive and "pit" readily on pressure. In some cases the hypersensitiveness may not be especially noticeable. Some reactors will show in addition the classical ophthalmic reaction with lachrymation, profuse, purulent, conjunctivitis, photophobia, depression, etc. While positive and negative intradermic reactions will usually be distinct and can be conclusively determined without question, a small percentage may show at the time of reading a slight swelling with edema of the lid which are doubtful and should be retested in the other eye immediately and checked by means of the serum test, as has been customary in doubtful reactions to the ophthalmic test.

Some infected animals will show a decided reaction at the tenth or twelfth hour, which will increase until it reaches its maximum at the thirty-sixth or forty-eighth hour. Other reactions appear slowly. All typical swellings on positive cases will remain for from three to four days, disappearing gradually until the eye presents its normal appearance.

Reading the Test

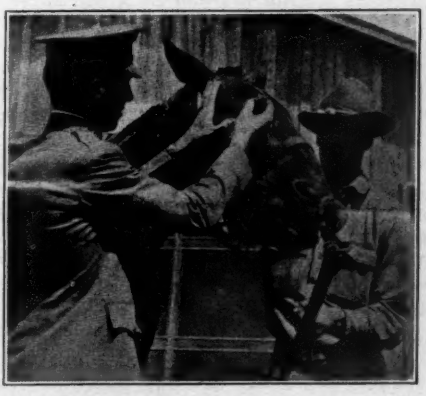
The test will be read for all the animals within a period of from forty to forty-eight hours after injection. All animals showing no reaction at this reading should be considered glanders free. All doubtful cases must be removed at this time and carefully observed and examined at least three times during the next twenty-four hours.

The veterinary officer should be on a chute as animals pass through for observation. He should stand on the run-board facing the animal. In this manner eyes are easily observed and compared. Doubtful cases should be stopped in the chute for more careful inspection, and if a suspicious or positive reaction is apparent, the animal must be placed in isolation promptly.

No test for glanders is infallible. For this reason, a careful physical examination must be made of each animal. It is best to make this examination at the time of reading this test. Particular attention should be given to a discharge from the nose or abscesses wherever located. The intermaxillary glands of every animal should be palpated. If there is a discharge from the nose, a careful inspection should be made of each nostril. All cicatrices or ulcers in this region should be carefully inspected. An animal with any positive symptom of glanders should be promptly destroyed, regardless of what or how many tests it may have passed successfully. It will not be held for further mallein testing of any nature. Those with suspicious physical symptoms should be isolated at once and every effort made to determine the presence or absence of glanders.

General Instructions

The intradermic test will not be used at the time of purchase, for the reason that three days are required to complete



Showing method of inserting the needle; restraining with halter and twitch.

the reading. All newly purchased animals will be given the ophthalmic test at the time of purchase, and submitted to either the ophthalmic or intradermic mallein test as soon as practicable after arrival at an auxiliary remount depot and must pass a satisfactory test at the depot before being released from quarantine and permitted to come in contact with other animals.

It is contemplated to replace the ophthalmic with the intradermic test at other than purchasing places, and this as soon as the syringes and mallein are available and veterinary officers have been properly instructed in the necessary technic under the supervision of a general veterinary inspector. Veterinary officers will continue to use the ophthalmic test until these facilities are available and until such instruction has been received and officers are fully competent.

The intradermic test will not be used as a check on the ophthalmic nor vice versa. A test will be completed with the method by which it was begun.

This office is again forced to draw the attention of all depot and unit veterinarians to the importance of the task before them in the eradication of glanders. This is by all means the most serious problem which confronts the Veterinary Corps today. The results thus far obtained are not satisfactory and the importance of constant and unremitting attention in the application of every detail of the various instructions on the subject of glanders is again emphasized.

No animals should be allowed to remain untested for a long period. It is no excuse for not testing to state that there was no reason for suspecting infection. The veterinarian is wholly responsible for advising when tests should be made and no veterinarian is justified in regarding his station free from glanders unless he can prove such to be the case by records of frequently repeated tests. The presence of the disease will always be suspected in the absence of evidence to the contrary.

Every assistance in this work has been promised by the Remount Division and will be afforded by this office and failure to discover cases promptly by means of frequent tests will be considered a direct reflection on the efficiency of the responsible veterinarian.

DOCTOR H. S. WARD DEAD

Dr. H. S. Ward, state veterinarian of Minnesota, and secretary of the U. S. Live Stock Sanitary Association, died at his home in St. Paul, December 14th, from influenza and complications. Doctor Ward was stricken with influenza December 3rd, while in Chicago serving as secretary of the U. S. Live Stock Sanitary Association, which was in session at that time. He remained in Chicago more than a week, and had apparently recovered when he returned to St. Paul. He died forty-eight hours later. Funeral services were held in St. Paul and interment at Selkirk, Manitoba.

Dr. Ward was one of the most widely known veterinarians in America, and no one in the profession was more popular or held in greater esteem. He was born in England, 54 years ago, graduated from the Ontario Veterinary College in 1894, and located for practice first at Selkirk, Manitoba, and later at St. Cloud, Minn., where he remained until 1903, when he became associated with the Minnesota Live Stock Board in the capacity of state veterinarian; this position he held until his death, with the exception of an interval of two years, which he spent as the head of the Meat Inspection Department of Canada, which department he organized.

Dr. Ward became a member of the A. V. M. A. in 1898, and served on many important committees; during the past few years on the committee on intelligence and education in carrying out the duties of this committee he visited all the veterinary colleges and reported to the association the condition of the schools and the quality of instructions given. He was a former president of the U. S. Live Stock Association, but was best known for his splendid work in the eradication of tuberculosis from pure-bred herds in Minnesota and for his efficient administration of live stock sanitary affairs in Minnesota.

Dr. Ward had a varied and broad experience in the adventures of life. As a young man he freighted fish by dog team across Lake Winnipeg during several winters when the mercury was frozen solid, figuratively speaking. He is survived by a widow, a son, a daughter and two sisters. His place in Minnesota and in the profession at large will not be easily filled.

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Thirteen Years

WITH this issue this magazine begins volume fourteen—its fourteenth year of publication, its twelfth year under the present ownership and editorial control, and its ninth year of publication at Chicago as the AMERICAN JOURNAL OF VETERINARY MEDICINE.

The AMERICAN JOURNAL OF VETERINARY MEDICINE has the distinction of being the oldest veterinary publication in America; during more than two-thirds of its career it has enjoyed the distinction of having the greatest circulation possessed by any veterinary magazine in the world. Although there have been two veterinary journals published in this country for a longer period—"The Journal of Comparative Medicine and Veterinary Archives," published for nearly 25 years, and the "American Veterinary Review," for almost 40 years—the total number of copies of the AMERICAN JOURNAL OF VETERINARY MEDICINE distributed has far exceeded that of any, perhaps all, other veterinary publications in America; its influence on the profession, measured by the standard of other publications, has been so predominating as to make comparisons futile.

This publication has from the first urged its readers to affiliate with associations, to organize and to make their influence felt as organizations. Due in no small part to the favorable attitude that this has engendered towards Veterinary Associations, it has seen the membership of the A. V. M. A. increase from 700 to 3,500. It has seen all of the older state associations increase greatly in membership, some of them showing an even greater percentage of growth than the A. V. M. A. It has seen more state associations organized than were in existence when it began urging its readers to join state associations. It has urged the formation of local associations and seen these increase from a half dozen to more than a hundred. It was the first, and for some years the only advocate of reorganization of the A. V. M. A. and presented a plan for such reorganization which was later in the main adopted with a resultant great gain in efficiency by the association.

It has insistently, month in and month out, advocated the wider use of anesthetics, first, for humanitarian reasons, and, second, for financial reasons, and it has seen the sentiment in this respect revolutionized. When it began this advocacy of anesthetics, their use in private veterinary hospitals was deplorably deficient, and not infrequently painful operations were performed before association clinics on animals that were not anesthetized. This latter spectacle is no longer witnessed and would not be tolerated in any veterinary association. Failure to use anesthetics in hospitals and field practice is the rare exception now.

From the first this publication has urged greater refinement in the drugs used in practice and a more careful selection of therapeutic agents, with the most gratifying results. The importance of preventive medicine and of sanitation has been continually stressed and the use of biologics in this connection urged. This publication was the first, and for some time, the only one advocating the use of bacterins. The soundness of this is

shown by the extraordinary rapidity with which their use extended and their wide adoption at the present time. At the same time it has been singularly fortunate in appraising fads which were destined to turn out delusions, at their true worth and to caution its readers against them.

It has been almost solely responsible for the great demand for veterinary books that has existed during the past six or seven years and, indirectly, for the publication of the many splendid veterinary works that have enriched American veterinary literature during that time. Formerly the profession was dependent largely upon European veterinary textbooks, and American works of reference had but slight distribution. Now there is a large and increasing number of American veterinary text books better adapted to our needs than those of other countries could be, and the extent of the sale of veterinary works for the practitioner during recent years has astonished those familiar with these matters.

More news items and other information pertaining to the army veterinary corps and the veterinary profession in the army and more illustrations pertaining to military men and matters have appeared in our "Army Veterinary Corps Miscellany," during the past year, than has been published elsewhere in English, including all British and all other American veterinary publications and the general press. No medical journal has published a proportionate amount concerning the medical corps of the army. This material has been difficult to get, but that is no obstacle when our readers want it.

Of course, not everything that the JOURNAL has advocated during the past thirteen years has been accomplished. If it had been it might lessen the need for its continued existence, which, quite to the contrary, is greater now than ever before. It has been the leading advocate of legislation for improving the conditions of the army veterinarian, and, undoubtedly, was chiefly responsible in placing the profession solidly behind the demand for such legislation. Something —yes, much—was accomplished in this, but not nearly enough. The war has given us additional evidence supporting that for which we have all long contended and offers hope that more may be accomplished.

We have insistently and continuously urged that veterinarians in the Bureau of Animal Industry be better paid. In this almost nothing has been accomplished, and from the present outlook more remains to be done to bring about this essential to the best interest of the whole profession than has yet been accomplished. It is only fair to say that those in control of measures for obtaining increases in the salaries of veterinarians in the Bureau of Animal Industry have never been in agreement with the measures advocated by the JOURNAL. It is idle now to say that if the advice of the JOURNAL had been followed more would have been accomplished, yet the fact remains that its advice was not followed and next to nothing has been accomplished.

We have continuously urged that general practitioners be given more consideration in all measures designed for the control of animal diseases or to bring about better live stock sanitary conditions. Some measure of success has been obtained in this, but there still remains much to be accomplished. Although the Bureau of Animal Industry and the State Live Stock Sanitary Commissions recognize the practitioner far more now than they did some years ago, they must get yet closer to him if they would accomplish the greatest amount of good possible with the funds at their disposal.

We have urged that arrangements be made with all practitioners to report the occurrence of every case of contagious disease in animals to some central authority in the state and that weekly bulletins of morbidity and mortality be issued to the practitioners so reporting. This plan has not yet been adopted in any state, but it is receiving attention in several of them and may be given a trial soon.

The foregoing record of achievements of this JOURNAL for the good of the veterinary profession, and it contains but an absurdly small part of all that has been accomplished, is given without any feeling of self-praise. Whatever has been accomplished by this publication, and it undeniably has been much, has been accomplished only through the loyal support of its army of readers. The strength of a publication, such as this, lies wholly in the trust that is placed by its readers in its faithfulness, in its constant endeavor to present the facts that interest them truly and faithfully, and in its consistency

in advocating public policies. This publication has probably differed from all others in its special field more in the advocacy of policies than in any other matter. It has always been recognized as having a definite aim—improvement of, and the welfare of the veterinary profession—and definite concrete measures for bringing it about. No one has ever been left in doubt as to the position of the JOURNAL on any public question concerning the profession, and no one who has really known it has ever questioned its sincerity. This has given it in individuality, a hold on the profession, and a place in the hearts of its readers that has enabled it to survive the trying conditions of the past two years; conditions more trying than those that have caused the suspension of all American veterinary publications that preceded it and have necessitated very large increases in subscription and advertising rates, has enabled it not only to survive these conditions, but to actually grow in spite of them, and to come through to the present time with more and better satisfied subscribers and more and better satisfied advertisers than ever before in its history. With conditions in general beginning to get back to normal, we hopefully and confidently look forward to a more plentiful supply of paper and perhaps some decrease in the cost of printing, and an early return to the larger size, which is so imperatively necessary for the publication of even the major portion of the good articles and case reports that we receive.

MR. BRENNER

IN leaving our organization Mr. I. C. Brenner takes with him the utmost good wishes of his associates. The period of his affiliation has been short, at least it has seemed short, perhaps because it has been uninterruptedly pleasant, as Mr. Brenner's associations unfailingly are.

In the four years that he has been with us he has accomplished some truly remarkable achievements, the greatest of which has been the forming of a personal acquaintance with at least twice as many veterinarians as are known to any other one man, regardless of the period of his activity in veterinary matters. He enjoys the genuine friendship of nearly everyone that he knows; few veterinarians have ever met one of more likable personality, or more genial amiability. Mr. Brenner came to the JOURNAL with a definite purpose. He achieved it well, beyond the expectations of his associates. The JOURNAL and the whole veterinary profession of America has been permanently benefited by his work.

When he came to us Mr. Brenner was no novice in journalism; his experience in metropolitan newspaper work and in writing for publications had been varied. As a salesman he possesses natural ability of a high order. It only remained for him to familiarize himself with this particular field to fit into and further our plans, which were to take the JOURNAL and its message of helpfulness to every part of the country, seeking out the places where veterinarians were to be found who did not attend veterinary meetings or read veterinary literature of any sort—good men—but men who had started out for themselves in the beginning of their professional career and who had allowed themselves to get out of touch with the profession and its progress. There were hundreds, yes, thousands, of these about whom veterinary associations, other veterinary publications, veterinary officials, and even veterinary commercial houses (because they did not know of them) had never concerned themselves.

Our plan was to reach these men through the more progressive members of the profession in their states and communities. After two and one-half years work of this kind Mr. Brenner had formed the acquaintance and friendship, and secured the co-operation of about all who attend any veterinary meetings in territory in which he worked. He had traveled by railroad. It was then realized that if his work was to be complete, if he was to reach every veterinarian in any given territory, to economize time he must travel by automobile, and so commenced his famous automobile trip lasting more than a year and a half. The success of this trip exceeded the most sanguine expectations of any of us. The counterpart of this trip has never been made by anyone and an automobile trip of equal magnitude has never been made in the interest of any other publication. Coast-to-coast auto-trips have been made in the interest of several of the automobile journals but in mileage covered, time consumed, and work done they dwarf into insignificance, in comparison with Bren-

ner's. Longer trips have been made in the interest of a few of the automobile manufacturers and manufacturers of auto accessories, but they have been vastly different; those making the trip were not salesmen, they did no detail work. These trips were, in fact, simply endurance contests, undertaken solely for advertising purposes. They were in charge of expert auto-mechanics, who kept as far as possible to the well-beaten highways.

To say that because of Mr. Brenner's personal call upon these men in their homes and at their offices, the AMERICAN JOURNAL OF VETERINARY MEDICINE occupies a place in the respect and confidence of thousands of veterinarians it never could have occupied otherwise and no other publication can ever occupy, is so obvious that it loses force. To say that this trip has brought us an intimate familiarity with the wants, hopes, and ambitions of these men that never could be obtained at long range is equally unnecessary. They are now something more to us than unknown subscribers and customers and the JOURNAL is more to them than the current history of the progress of the profession.

Many have asked us regarding the practicability of the automobile as a means of conveyance on long trips and the expense as compared with travel by rail. Others may be interested. Mr. Brenner gained in health, strength and weight, during the trip. Mrs. Brenner accompanied him a part of the time and found the trip no hardship. In twenty months he was delayed less than two weeks waiting for repairs to his automobile. His salary and expenses ran around $450.00 per month in the early months of the trip and about $625.00 a month near the end. The latter figure is higher than it would be ordinarily. The increase was due in part to the higher cost of gasoline, the very much higher hotel rates that obtained on account of the war and to the considerably greater cost of auto-upkeep, due to natural wear and tear on a machine that had run 30,000 miles, much of the distance over the worst roads in America. The trip will be repeated after a few years.

Army Veterinary Corps Miscellany

ALTHOUGH the signing of the armistice has warranted the veterinary corps of the army in dropping about 400 officers who were keen to leave the service, there will be no general disorganization of the corps so long as the quartermaster corps retains possession of the present quota of horses.

So far no provision has been made for the disposition of any but a very small number of horses, which necessitates the keeping of a considerable veterinary corps on the job until such time as the future of the army is determined by its heads and by congress.

The size of the army of occupation and the imminence of a campaign or campaigns in Russia are factors that will enter largely into determining, of course, the number of horses kept for military purposes and accordingly, will measure the necessities of the veterinary corps.

The remount stock on hand as of November 2 is shown by a report made by the Statistical Division to Brig. Gen. Robert E. Wood, Acting Q. M. G. and Director of Purchase and Storage. This shows the horses and mules at remount depots, forts, posts and garrisons and ports and in transit to or from these places in the United States and the number in France and on board ship in transit to France. There was a total of 113,725 cavalry and riding horses, 186,348 draft horses, 144,611 draft mules, 17,298 pack and riding mules and 15,280 unclassified animals, making a total of 477,262 animals ready for use. This report also shows the stock of forage on hand as of November 1 at depots, camps, forts, posts and garrisons in the United States and on board ship and in transit to and at depots in France. The stocks were: 24,818 tons of bran, 185,032 tons of hay, 158,845 tons of oats and 46,281 tons of straw. The stock of harness on hand as of November 1 includes stocks at depots, camps, forts, posts and garrisons in the United States and on board ship in transit to France and is as follows: 12,664 complete aparejos, 51,292 sets of ambulance or wagon lead single set harness, 50,619 sets of ambulance or wagon wheel single set harness, 11,697 sets of Dutch collar ambulance or combat single set lead harness, 23,193 sets of Dutch collar ambulance or combat single set wheel harness,

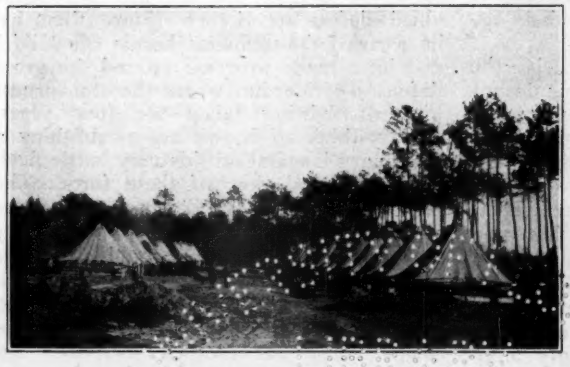
5,527 sets of breast collar wheel cable traces harness, 5,831 sets breast collar lead cable traces harness, 1,099 double set buckboard harness, 10,635 sets of cart harness, 5,887 sets of combat, hame and collar, lead harness, 5,292 sets of hame and collar wheel harness, 28,661 riding bridles, 418,576 halters (head only, less ties), 589,335 complete halters, 9,847 saddle bags and 14,921 saddles (packers, riding, full-rigged). Leather on hand includes 7,426 sheep skins (with wool), 412,431 pounds of harness leather, and 88,216 square feet of latigo leather.

Veterinary Company No. 1 at Camp Greenleaf was discharged December 14th, exactly one month after its discharge had been ordered by the Department at Washington. This company included 470 graduate veterinarians, nearly all 1918 graduates, who were serving as privates at $30.00 a month. To say they were restive at the delay in discharging them, and chagrined at the failure to commission them upon the completion of their period of training is putting it mildly.

These men had joined the M. E. R. C. to be permitted to complete their college course, had been called to the colors in May and June, with the understanding that after eight or ten weeks' training they would be given an examination for a commission and those that passed would get commissions in advance of applicants from civil life. They received their training, those who passed the examinations were recommended for commissions, were held six months and discharged still privates, considerable of their time in military service having been spent on special detail which consisted of grooming and saddling and feeding and watering the 400 horses at Camp Greenleaf used by the medical officers in training there and in cleaning out the stables. Their retention in the camp thirty days after their discharge should have been carried out seemed to them to serve no useful purpose, put the government to thousands of dollars of unnecessary expense, and cost each of these men a month's time besides what they would have been able to make in practice or in other employment during that time.

But great as has been the discontent among veterinarians at Camp Greenleaf it has been less than at the Veterinary Training School at Camp Lee, where protests have been made of a vigor perhaps without precedent in the American Army in this war at least. For reasons which have not been given, demobilization of those at the Veterinary Training School at Camp Lee has been retarded. This has added to the dissatisfaction and unrest that has existed at the school for some time. Even the enlisted men at the school look upon their continued retention at the camp as utterly useless and aimless. About one hundred of these privates are graduate veterinarians who put in their application as authorized by Circular No. 77, W. D., but are now being turned down. They see no chance for commissions, and as most of them left good practices to which they are anxious to return, they most strenuously object to being held at the Camp. The fact that about 500 graduates of the 1918 class have been discharged and are now looking for desirable locations for practice has added to the feeling of uneasiness on the part of these men at Camp Lee.

Recently when the veterinary officers at Camp Lee and elsewhere filled out application blanks, asking for their discharge, in a certain group of 105 who



A camp "over there" where warm clothing is appreciated. Writing from near this camp, Maj. J. H. Blattenberg says that he has been in command of the best equipped veterinary hospital in France (Base hospital No. 6) for the past four months; that he has a good corps of officers and three companies of men but the next thing he wants is to get back to the U. S. A. and that it is wonderful to be a citizen of such a country, without whose efforts the cause would have been lost. He writes interestingly of a horseback ride on a Sunday recently to the church where Joan of Arc received her inspiration. You know now what will take the popular major to church.

CAPTAIN C. CARY JARMAN.
This is a son of Captain Jarman, Division Veterinarian, 96th Division, and has the distinction of having been made a captain when barely twenty-one years of age.

were asked if they were willing to accept the same commissions they now had, in the Veterinary Reserve, 104 answered "No." Washington called on their commanding officer for an explanation of this and a meeting was called and the officers asked to express their sentiments. It is doubtful if any other commanding officer ever had an experience that equalled this. It is said that the veterinary officers expressed their thoughts in a sulphurous vocabulary that was positively unique. The matter has been carried to the Halls of Congress. Two or three hundred telegrams and many hundred letters have been sent to representatives regarding the matter. In the meantime all veterinary legislation that might be presented in Congress is blocked. They will probably get their discharges at an early date.

One thing stands out most clearly: the great majority of the veterinarians do not like army life under the present conditions. While the war lasted and there was likelihood of their having an opportunity to have a part in it and serve the country to advantage, everything tending to dissatisfaction was overlooked, but now that the war is over, those on this side who, up until the present time, have been treated more liberally in the matter of promotion, than those who went "over there" early in the war, are exceedingly anxious for their discharge and wish to return to civil life where their services are badly needed by the livestock industry.

Army Veterinarians have joined the A. V. M. A. in large numbers, nearly 400 applicants were elected to membership in Philadelphia, and as many more applications are already on file to be acted upon at the New Orleans meeting. These men naturally look to the A. V. M. A. to champion their cause and to father legislation in Congress for the betterment of the Veterinary Corps and to plead their cause at the War Department, in the matter of discharge. If the A. V. M. A. lives up to its opportunities in this, these recruits to its membership in the army may well prove the most desirable addition to its membership that it has ever had, and it may count upon their influence in the thousands of communities in which these men will later be located. Should the national organization, on the other hand, be deaf to their pleas, should it attempt to gloss over errors on the part of prominent members, or make any liberal use of the whitewash brush, it will run afoul of the sentiment of a powerful faction and it will handicap in advance its future efforts for the good of the veterinary profession and may precipitate a ruction at the New Orleans meeting that will put ringside seats at a premium.

Entrance of American Army Into Verdun

Writing on October 24th a veterinarian in the first army gives the following description of the entrance of the American Army into Verdun. We think none of the many war correspondents who have supplied America with news of this event have given a better description:

"July 15th to August 15th history will show we actually turned the war from allied defeat to victory. Since then we have cured the umbilical hernia St. Mihiel and have made progress around the great defenses of Verdun where the stubbornest kind of fighting failed for four years. Today, think of it, we are establishing a veterinary hospital on this very battle field, right in the shadow of these forts. The city is now free, and I hope soon to be restored to its population. I wish every veterinarian in America could visit this awful scene during these days. We call it the "City of Death," for it is nothing but a great abandoned city in which no single house has escaped shell-fire. No

Major Blattenberg forced to borrow French transportation when with the veterinary corps at the Front.

one has lived here for four years, except in subterranean retreats, the citadel where defenders stayed for their safety. Some of the streets have been opened up recently by throwing the fallen stones upon the sidewalks but most of them remain impassable for vehicles. The houses, many of which have been splendid mansions and business houses, are moldy and the strange odor of this great abandoned mass adds to the gruesomeness of the sight. When Verdun rises out of its tomb and is again the beautiful city it once was the world will bow its head in prayer for its American saviors, for this was, indeed, a task for red-blooded men.

"There are still dark days ahead, but no one is going to quit until the job is well done. We are fighting today upon very difficult terrain and what we lack in linear advance we make up in strategic advantages and in the great numbers of prisoners we keep bringing back. The best sight for American sore eyes is a few doughboys coming in with a few thousand Boche prisoners, and we are fetching them in by hordes these days.

"The veterinary service has had a rough and rugged road to travel in France, but through persistent efforts it has kept its head above water and promises to become a great institution. The story of our struggle will some day be told, and I am sure when fully understood will bring much credit to those who came with the first expeditionary force and stayed valiantly through the months of discouragements without flinching and until the service, as such, was finally installed into an unwilling army.

A veterinary officer in the 88th Division writes on November 14th:

"The war seems to be finished. Everybody is still busy and still on the job. We all hope to be back in the States soon, although we propose to stick to the ship until the last rat is out.

"I saw Major Charles H. Jewell the other day, holding down the Chief Veterinarian chair of the Second Army. He is up to his neck in business and as happy as ever.

"Major Hanvey is with Evacuation Hospital No. 5, and busier than a cranberry merchant, and doing most excellent work and receiving many compliments.

"Our Division has been on the move almost continuously since reaching France. We have been actively engaged on the front and now expect to be on the trail of the retreating Germans, and field service over here is no picnic, even though we are on their trail.

"All the veterinarians of the 88th Division send you their very best regards and wish you a lot of good luck and continued prosperity, and hope that you will get the JOURNALS to them better in the future than you have in the past. None of us think it is your fault because they haven't arrived, however."

Lt. E. J. Snyder, of Fremont, Ohio, died recently on a transport on his way to France. His body was returned and

Major Blattenberg, fully equipped at the Front.

interment took place at Fremont. Lt. Snyder was a graduate of the Chicago Veterinary College, '05, and was about 29 years of age.

Lt. J. C. Cox was killed in action shortly before the armistice was signed. Lt. Cox graduated from the Kansas City Veterinary College and formerly practiced at Tonkawa, Oklahoma. He was 48 years old, and leaves a widow and two children. He was killed by a piece of shrapnel piercing his heart.

Dr. N. E. Gruenwald, of Hazleton, N. D., was recently reported killed in action in France.

Major Charles E. Cotton, who has been inspecting the veterinary corps at Camp Bowie, reports that the condition of the camp compares favorably with all others in the district. There are, however, fewer men and horses there than at Camp Cody. Major Cotton has been appointed inspector of the entire Southwest district and maintains headquarters at Fort Worth.

Hailing from South Bend, Ind., where

CAPTAIN R. M. HOFFERD.

Captain Hofferd, who is only 21 years old, enlisted July, 1917. He is Veterinarian for the 92nd Division, overseas.

poems and novels grow on every bush and tree, it follows as a matter of course that Captain Charles M. Stull, camp veterinarian at Camp Bowie, Texas, should be the author of a book of interesting war poems, his modesty causing him to issue them under the non de plume, "Pop."

Lt. E. P. Snortum, of Canby, Minn., has recovered from pneumonia following influenza, contracted while in camp. He is loud in his praise of the treatment accorded him in the hospital, where he had the added comfort of being cared for by his wife. He is now located at Camp Greenleaf.

2nd Lt. E. B. Parker promoted to be a first lieutenant; transferred from Camp Stanley to Camp Knox. Lt. Parker states that they have a rather remarkable detachment at Camp Knox, four out of six men in his charge being graduate veterinarians. He states that he is having excellent success in the treatment of the animals in his regiment, the 67th F. A.

Having completed the course of training at Camp Greenleaf and received a commission, Lt. H. C. Etchison has been doing duty at the Port Terminal Branch, Animal Embarkation Depot No. 302, North Charleston, S. C. He hopes soon to return to his practice at Assumption, Ill.

Dr. D. M. Carey, of Wells Minn., now in the training camp at Camp Lee, expresses appreciation of the excellent training they are getting, which he says is in the nature of an advanced veterinary course. He speaks of the splendid opportunity afforded there for study of lameness, as well as diseases of various kinds, in the veterinary hospital, which has the distinction of being the largest in the United States. He speaks in the highest terms of the work of the Red Cross, the Y. M. C. A. and the K. C., and of the treatment accorded "the boys" in general.

Dr. Wilbert M. Kyle, formerly in service at Camp Greenleaf, having been honorably discharged, has returned to his practice at Highland, Ill.

Dr. J. A. Campbell, a member of the faculty of the Ontario Veterinary College, has been commissioned a major in the Canadian Army Veterinary Corps, and has gone overseas with the Siberian Expeditionary Force, as a member of the 16th Infantry Brigade.

Alpha Psi Entertains at Camp Greenleaf

Members of the Alpha Psi fraternity were hosts recently at one of the largest social affairs yet attempted by Camp Greenleaf organizations, the occasion being a banquet and dance at the Hotel Patten. Over 100 members of the order were present at the event, the first in the order's history in which so many khaki-clad men have been present at one of its entertainments. Following the banquet, Capt. F. A. Lambert as toastmaster introduced the following members of the different chapters, who responded to toasts:

Alpha Chapter—Ohio State University, Dr. R. F. Lubbehusen.

Beta Chapter—Cornell University, Dr. H. F. Fleming.

Delta Chapter—Kansas City Veterinary College, Dr. L. F. Nisley.

Epsilon Chapter—University of Pennsylvania, Dr. U. J. Martin.

Gamma Chapter—Chicago Veterinary College, Dr. G. J. Anderson.

Eta Chapter—Kansas State Agricultural College, Dr. C. A. Libby.

Kappa Chapter—Washington State College, Dr. E. A. Ehmer.

Theta Chapter—Alabama Tech. Dr. W. F. Donahue.

Ioto Chapter—Michigan State College, Dr. D. C. Beaver.

Zeta Chapter—University of Colorado, Dr. E. H. Hover.

The closing feature was a "hop." Following were the members of the committee: Dr. L. H. Tripp Dr. F. H. Kelley, Dr. H. C. Rea, Dr. E. E. Ryerson.

Recent Appointments, Promotions and Assignments

Following promoted to be Majors: Captains G. R. Powell, W. J. Ratigan, J. A. Summerville, P. V. Weaver, J. L. Wells.

Officers of V.C. to places specified for duty: Capts. J. E. Bebney, Camp Travis, Fort Sam Houston, Texas; T. B. Hinkle, Camp Travis, Fort Sam Houston, Texas; F. B. Gage, Fort Oglethorpe; 1st Lieuts. G. H. Conn, Camp Zachary Taylor, Louisville, Ky.; F. B. Croll, Camp Dodge, Des Moines, Iowa; A. J. Crumbaugh, Camp Funston, Fort Riley, Kas.; J. Doerr, Camp Dodge, Des Moines, Iowa; W. H. Houston, Fort Reno, Okla.; H. W. Naylor, Camp Grant, Rockford, Ill.; E. R. Worley, Camp Funston, Fort Riley, Kas.; R. H. Becker, to Camp Kearny, Remount Depot; W. L. Herbert, to Camp Meade; 2nd. Lt. A. Saperstein, to Camp Lee.

Officers' Right to Title and Uniform

Unless Congress passes special legislation to fit the case, the thousands of officers of the emergency forces of the United States who have been or are to be discharged, will not, after discharge, be entitled under the law to be addressed by the titles of their war-time rank.

As for the uniform, the National Defense Act, in Section 125, permits **"any person** who has been honorably discharged from the United States Army, Navy or Marine Corps, Regular or Volunteer, to wear his uniform from the place of his discharge to his home, within three months after the date of his discharge." The same section as amended by the Army Appropriation Act of July 9, 1918, requires the discharged enlisted man to return all uniform clothing within four months after termination of active service. Several bills have been introduced in Congress at this session to authorize the honorably discharged soldier to retain permanently the uniform in his possession at the time of his discharge, and one such measure, introduced by Chairman Dent, of the House Committee on Military Affairs, was passed by the House on Dec. 16. The Senate so far has not considered the measure.

Medical Enlisted Reserve Corps

There has been considerable doubt at to the status of men in the Medical Enlisted Reserve Corps of the Army, especially those ordered to active duty. We are informed by the Office of the Surgeon General that the status of the two groups are quite different. Men who are in the Medical Enlisted Reserve Corps and have not been called to active duty will remain in that corps, until the entire corps is demobilized; that is, individual applications for discharge from the Medical Enlisted Reserve Corps will not be approved. It is impossible to predict at this time when the entire Medical Enlisted Reserve Corps will be discharged. Men who were formerly in the Medical Enlisted Corps, but have been called to active duty, are no longer members of that corps, but are soldiers on active duty in the personnel of the Medical Department of the Army. Such men must await their turn in the general demobilization. It is rumored that it is the intention to discharge in the near future all graduates of medicine, dentistry and veterinary medicine who are now serving as enlisted men.—*Army and Navy Journal.*

The remount station will sell during January over 44,455 army horses and mules. This will reduce the number of the army animals in America to 200,000. The sales will be at public auction.

Each day news comes of various members of the veterinary corps receiving honorable discharges and returning to their practices. We extend the hospitality of our office to such as pass our way.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Poisoning from Sorghum and Sudan Grass

DR. A. H. QUINN of Creston, Iowa and Dr. F. C. Carter of Sedalia, Missouri, ask for literature bearing on the subject of amygdalin in sorghum and sorghum poisoning. Dr. Quinn states that "several valuable milk cows died suddenly in great pain with extreme tympany, after eating small amounts of young cane." Creston and other sections of southwestern Iowa this year were very dry, and this may account for the presence of amygdalin in such cane. Some years ago, Dr. Peters made an investigation of sorghum and kaffir corn poisoning in Nebraska and Colorado. Cases were also investigated by Dr. G. H. Glover. Twenty-one out of thirty-two cows died within an hour after being placed upon the feed. Dr. A. T. Peters, of Nebraska, investigated the subject of poisoning from sorghum and kaffir corn. He states that in most cases where deaths of animals occurred, the animals did not regularly pasture upon sorghum, but broke into the fields from adjacent pastures or ate it as they were being driven past fields of sorghum. The investigation proved that the animals did not die from bloat as had been reported. The following further statement was made: "The cattle died on August 20th. We lost 21 head out of 32 which had been turned on the corn. Eleven head lived, but of these, 4 had violent spasms, but recovered The other 7 head were not affected. They were only on the corn five or six minutes. The first cow died in 15 minutes; nearly all within an hour. One yearling lived over six hours. I gave it several doses of aconite, thinking possibly one poison would counteract the other, but it died in great agony. The cattle seemed to all go crazy at once, then stagger like a person intoxicated, fall in all directions and die where they fell. I stuck all of them with a knife, the same as in alfalfa bloat, but there was no gas in any of them. The kaffir corn was planted on sod ground above irrigation. It was from 6 to 15 inches high and was burnt brown from the drouth." A chemical analysis later made from this material showed that these samples yielded greater amounts of prussic acid than those in more moist sections of Nebraska.

The following very interesting case of poisoning from sudan grass has been communicated to me by Dr. A. I. Kulp of Adel, Iowa: "Under separate cover I am sending you, by express, a small quantity of sudan grass of second cutting, cut about a week ago, but left about two days then put into quite large piles and left for three or four days and just when at its toughest (in a sweat), was fed to 13 milk cows. Four died within an hour and three others were affected but recovered nicely within a few hours after they first showed symptoms. These cows had been fed on the first cutting for about two weeks, but the hay was left to dry longer before being placed in piles. We began feeding the second cutting Friday evening, August 30; fed morning and evening, including the morning of September 1, noticed nothing until about 11 a. m., when one cow was noticed standing with eyes closed, ears drooping, staggering gait. It soon fell, and was dead in less than an hour. Three others became affected about the same time and died very suddenly. The fifth, sixth and seventh cows showed mild symptoms after a few hours, but were soon all right again. These cows were also fed corn fodder, cut in a corn field and fed at once. This corn was partly dead, but it had failed to mature or develop because of lack of moisture. They had been eating this corn for six weeks. The sudan grass

in the piles was damp on the inside and had a slightly moldy odor. I could find no other cause for the trouble except the sudan grass or the corn, as they had been fed the corn for six weeks and only the second cutting of sudan grass since last Friday evening, and being in this condition, I decided it must be the latter."

Sudan grass is closely related to sorghum. It produces the same glucoside *amygdalin* or *dhurrin*. When fed in a partially wilted condition it may produce cyanogensis as sorghum does. Sorghum, kaffir corn and sudan grass, however, all make good forage when properly cured.

White Snakeroot Poisonous in Illinois

During the summer Dr. R. F. Reeds of Hazel Dell, Ill., wrote me about the white snakeroot (*Eupatorium urticaefolium*) or the old *E. agueratoides* at that place. In this connection, I should like to call attention to an article by Dr. Schwarze, bacteriologist of Illinois Department of Agriculture, in which he states that white snakeroot was not found in the pasture in question. Dr. Reeds describes the symptoms as observed by him in the following letter: "I was called to treat three short yearlings which were found sick by owner in pasture. They presented the following symptoms, lying down, breathing rapid, temperature 103°; when made to arise would walk a few yards and drop down again, bowels normal, no thirst. Withheld diagnosis until next day, then made a diagnosis of trembles, or milk sickness. Treatment, four ounces spirits frumenti every three hours; one dram kalium iodid once daily, purged freely with sodium sulphate. Result, two calves died on the fifth day, the other one steadily recovering, but this one was not as sick as the other two and would eat a little. We let him have all the green corn he could eat. I asked Dr. C. E. Lucas of Olney, Ill., to see this calf and he agreed as to diagnosis and together we went over the pasture and in a little patch of weeds found the *E. ageratoides* in abundance, also found where the cattle had been browsing on the plant. This district, years ago, was a hot bed of so-called milk sickness. An old physician who practiced a few miles away was quite famous as a milk-sick doctor often curing where others failed and his treatment of the malady was large doses of aloes, tincture iodin in water and all the whiskey the patient would drink. I used this with some slight changes in treating these calves. This old doctor used to say that calomel would kill the patient if suffering from milk sickness. (This is hearsay, the old doctor having passed to his reward before I was born.)"

The Toxic Substance in Cottonseed

There has been much discussion as to the cause of poisoning from cottonseed meal. W. A. Withers and Frank E. Carruth in a paper on the toxic substance in cottonseed have made a careful scientific study of poisoning from cottonseed. They conclude as follows: "Raw cottonseed kernels contain about 0.6 per cent of gossypol, and are highly toxic to rats. Ether extraction renders the material nontoxic and gives a highly toxic extract containing about 2 per cent of gossypol. Gossypol fed in milk diets in amounts equivalent to those contained in the raw cottonseed diets has proved as toxic as raw cottonseed. Gossypol may be quantitatively removed from the ether extract by precipitation as its insoluble anilin compound. The extract is thus rendered nontoxic to rats. The insoluble anilin compound of gossypol is not toxic because of its insolubility. Gossypol prepared from this compound possesses its original toxic properties.

Cottonseed meal is much less toxic than raw cottonseed, owing mainly to the oxidation of gossypol during cooking.

Cottonseed meal, ether-extracted cottonseed, and gossypol have been fed to small pigs in pens under comparable conditions. Cottonseed meal has been found definitely injurious, while the ether-extracted raw seed does not appear to cause cottonseed-meal poisoning. Gossypol has been found toxic to pigs.

If the presence of an injurious substance in the meal is disregarded, a diet of cottonseed meal and corn-meal has nutritive limitations which may, under restricted conditions of living, lead to unthriftiness in pigs. Such failure is a phenomenon distinct from cottonseed-meal poisoning.

Outdoor exercise, access to forage and soil, and improved diets tend to postpone

Jour. Agrl. Research, 1918, 12, 83-102.

or avert cottonseed-meal poisoning of swine. The deficiency hypotheses that cottonseed-meal poisoning of swine is similar to beriberi is untenable.

Pingue Poisoning in Arizona

During the summer I received a letter from Dr. R. M. Scott of Williams, Arizona, as follows: "I am sending you, under separate cover three samples of a weed, which is very common in this district. The local sheep men claim that this weed is the cause of the death of large numbers of sheep every year. The symptoms described are bloating, frothing at the mouth, animal goes down in convulsions, death occurs in from one-half hour to two or three days. While in the recumbent position symptoms of cerebral disturbances are very marked." Being unfamiliar with the plant, I sent it to Dr. MacBride of the Gray Herbarium who identified it as *Hymenoxys floribunda*. Dr. Scott writes me again as follows: "I have since found the plant described in Dr. E. T. Baker's book "Sheep Diseases." He classifies it as *Hymenoxys floribunda*, also known by the Spanish name of *pingue* and commonly called rubber weed. He describes the symptoms as follows, 'The animal appears drowsy, and loses its appetite It lies down and refuses to get up. Death takes place in from one to several hours after the first symptoms are noted.' He also says that the cause is from the forming of a rubber-like obstruction in the intestinal tract. This conforms exactly with the symptoms given me by the local sheep men. They say 'it balls in the ponch.'" Dr. Scott was the first to call my attention to the article in Dr. Baker's excellent book on sheep diseases.

Poisoning from Potatoes

F. W. Harris and T. Cockburn[1] review a paper by P. B. Dunbar, who reported on 61 cases of poisoning from potatoes in the eastern district of Glasgow, Scotland. One case in a boy 5 years old, resulted fatally. Post-mortem examination showed that death was due to strangulation of the bowel, which might have been caused by extreme retching of vomiting. The viscera gave no indication of irritant poisoning and no dilation of the pupil was noticed. The cases were traced with reasonable certainty to a certain lot of potatoes. These were examined for mineral poisons with negative results. The potatoes were normal in appearance, firm and solid, but some, on cutting, showed a brownish indefinite line near the periphery. On standing a short time the sections showed a much more decided pink color than other samples similarly treated. The buds on quite a number showed decided evidence of sprouting, being about one-fourth inch long. Solanine was detected by the method of G. Meyer,[2] and the potatoes from the household where the fatal case occurred showed 0.41 part solanine per 1,000, while a sample from the store, supposed to be from the same consignment, showed 0.079 part per 1,000. Meyer reports 0.024 part per 1,000 in sound unsprouted potatoes and 0.040 to 0.066 in sound potatoes which had begun to sprout. The potatoes which caused the poisoning contained 5 to 6 times the normal content of solanine.

[1] Jour. Am. Chem. Soc., 1914.

Lupin and Aster Poisonous

The report of research chemist, O. A. Beath of the Wyoming Station, is summarized as follows:

Lupinus argenteus, regarded as the most poisonous of the native lupines, was submitted to an alkaloidal assay with the following results: Early pods, 0.4695 per cent; late seeds, 0.3346 per cent; early leaves, 0.3196 per cent; late pods, 0.2687 per cent; flowers, 0.232 per cent; early seeds, 0.1178 per cent. Crude alkaloids were computed as lupinin.

The finely powdered plants were exhausted with alcohol and the crude poisons after one purification were given to rabbits intravenously. In order of toxicity the following results were obtained: Early pods, lethal dose, 17 mg. per kilogram weight; early leaves, lethal dose, 17 mg.; flowers, lethal dose, 21 mg.; late seeds, lethal dose, 28 mg.; early seeds, lethal dose, 32 mg.; and late pods, very slightly toxic. While it has been reported that lupine alkaloids are easily soluble in water, repeated experiments were made with aqueous extracts with negative results as to toxicity.

A small quantity of poison was isolated from the woody aster for the first time.

[2] Archiv. f. Expr. Path. & Pharmakol, 1895, p. 361.

DEPARTMENT OF

BOVINE PRACTICE

Edited by JOHN FRANCIS DE VINE, D. V. S.

Requirements for Successful Cattle Practice

IN the treatment of bovines as with equines there are certain principles that seem to the inexperienced and even to some instructors in the science of veterinary medicine, too academic and unimportant to receive serious consideration in the college curriculum, which the man who enters practice discovers after he leaves his alma mater, but unfortunately often discovers it at a cost that is altogether too great. This "something" is not as tangible as a symposium on a particular disease, but we often hear it expressed by experienced practitioners and laymen, something like this, "That the new graduate or this or that veterinarian, may know his business but doesn't seem to know how to go about it."

In days gone by when the horse was king in the veterinary world, the veterinarian who was a natural horseman, who could ride, drive, select and judge a horse and who held himself aloof from the low trickery of the horse jockey, other things being equal, had an overwhelming advantage in practice over his brother practitioner who lacked these accomplishments. In other words, his natural adaptability coupled with his veterinary training, made it possible for him to handle, control and treat horses, under all conditions, just a little "smoother" and a little better than any of his lay clients or their subordinates, and many, many times the veterinarian's prestige and the rank of his ability was gaged *by what he did and how he did it,* rather than how scientifically his brain had been attuned with veterinary literature. True it is that in order to attain a high standing the veterinarian's objective ability had to be supplemented and backed by real veterinary knowledge in order to hold this high standing and to excel and supersede the glib "quack."

What has proved true in the practice of equine medicine is found to be equally true in the treatment of bovine animals.

In order that a man may become a successful bovine practitioner, a fairly constant requirement will be that, in addition to a thorough veterinary training, he must also have had some experience with cattle on the farm or the ranch previous to his entering a veterinary college, or he must needs have acquired it later in life by careful observation, in order to be able to differentiate the pathologic from the physiologic, taking into account the many peculiarities and idiosyncrasies that are distinctly bovine, and even these have their variations with the different breeds and different environments. Midway between this knowledge and the strictly veterinary phase, there is a certain amount of desirable information which might be styled scientific-practical knowledge, which pertains to the selecting, feeding, breeding and care of farm animals.

The skilled breeder will expect a veterinarian to be fully versed in these subjects and will soon discover the lack if he is not, and the wealthy client who has had no experience should, and probably will, in many cases, turn to the practitioner for advice when about to engage in the cattle industry. He should not be misguided or disappointed in these matters, or the entire profession will suffer for it.

The trained practitioner of today has outgrown the limited sphere of only prescribing for the sick animal. His services are now eagerly sought by the breeder, particularly the uninitiated, the novice, the man who has the enthusiasm and financial means, but lacks experience; and in no other phase of our professional work, can an individual, unofficial vet-

erinarian, begin to do so much good or so much harm as in an advisory capacity to the man of means who comes to him contemplating the operating of a large farm and the purchase and maintenance of a pure-bred herd. We should be able and willing to place before such clients a vivid picture of the pitfalls that will bring discouragement and possibly ruin if he disregards certain precautions and principles that are born of everyday experiences.

I doubt if there is an experienced practitioner who could not cite an instance of a wealthy business man who has launched into the dairy business, purchased pure-bred cattle on their pedigrees and appearance, with a total disregard of the insidious maladies that later burst forth in his palatial stables, either causing the condemnation of a large percentage of his herd on account of tuberculosis, or death of many of his choice calves either through white scours or abortion, and the derangement of the maternal organs perhaps of dams of great individuality and breeding, and a certain percentage of sterility throughout the herd forever after. Unfortunate and pitiful as this may be it is not comparable with the situation where a similar disaster has been brought on by the dishonest trickery of one of our profession, who for a filthy, stained fee will make a false health report or assist a seller in traffic in diseased animals. Our profession has a tremendous responsibility in the human and civic welfare of our country and is now destined to become an important factor in the solving of our world problems.

The public health, food conservation, live-stock raising, fertility of the soil, and assisting in the building up of an improved agriculture, are all problems that only a highly respectable profession can cope with.

In our next article we will make an attempt to point out some of the services that the practitioner may render to his community and so help our country at large by preventing losses in our dairy herds.

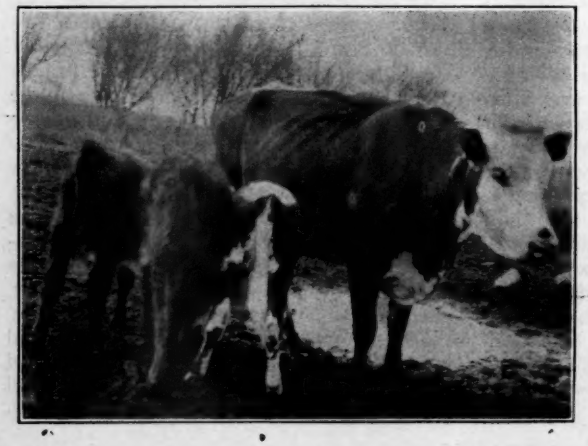
REMOVING PLACENTAL MEMBRANES

What is the best method of removing retained placental membranes in cows?

REPLY: For information on the removal of retained placenta, we refer you to the article, "Logical Treatment for the Retention of Fetal Membranes in the Bovine," by Dr. Silas Kempf, on page 15 of this issue.

SUNFLOWER AS STOCK FOOD

That the Russian sunflower is to play a big part in furnishing food for stock in the future, is the belief of stockmen in the West. This sunflower, known as the "Russian Giant," is a heavy producer, yielding as high as 18 to 24 tons per acre. The plant is cut green and stored in silos, four tons of the sunflower being considered equal to a ton of green alfalfa in feeding value. Only about three tons of alfalfa can be raised to the acre, while the sunflower yields as high as 24 tons.



The cows at Stanhope, Ia., have been "doing their bit" to help on the great cause, and as bona fide evidence, Dr. I. A. Anderson, of Stanhope, sent us the accompanying illustration showing a Stanhope cow and her "real triplets", all perfectly developed. Twins and triplets are classed as identical or heterologous on the assumption that the former are developed from a single ovum and really constitute a single individual that through some freak of nature is divided into two or three parts identical in all respects and the latter are the result of the simultaneous fertilization of two or three distinct ova. In this group both phenomena appear to have occurred. Two of the calves are identical in markings and the other is marked identically like the mother.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

Use of Coffee-Grounds in Field Service

By M. Fernand Friez, Veterinary Aide-Major of First Class.

Translated from the French by Major L. A. Merillat, U. S. A.

COFFEE-GROUNDS are a kitchen residue that can be obtained in quantities in large military organizations. By reason of stationary warfare, and above all since the invention and introduction of the movable kitchen, it is entirely feasible to utilize coffee-grounds in the treatment of domestic animals. The grounds possess in effect, but naturally to a lesser degree, the same properties as coffee, as is evidenced by the clear brown liquid with the taste and aroma of coffee resulting from the re-cooking of the grounds. Hence the administration of coffee-grounds in certain diseases of animals should afford the same therapeutic, or dietetic effects as would be expected of coffee or caffeine.

Administered by mouth to a sound horse, coffee-grounds exert: (1) an exciting action; (2) a diuretic action; (3) a laxative action.

The excitement is very pronounced in a pure-bred or half-bred horse. He neighs and becomes restless, as though he had received a large feed of oats. This action is less marked in the heavy draft horse; however, each time it brightens them up and augments the appetite.

The diuretic action is typical in all cases. It is not advisable to give the grounds to horses before being put at hard work or at parade, as it causes them to urinate frequently. It is unnecessary to add that it causes the animals to become exceedingly thirsty.

The laxative effect is slight, and is obtained generally only after several days' feeding. The feces are semi-liquid and numerous borborgygmi indicate the excitement of intestinal peristalsis.

With these effects noted in sound horses, the use of coffee-grounds for sick animals naturally follows. The exciting action is especially useful in weak lymphatic or convalescent animals. The diuretic effect which is associated with increased thirst should be utilized in all cases of the intoxication of the organism with bicrobian products as well as by-products of disintegration resulting from fatigue. The regimen of coffee-grounds is therefore recommended for horses affected with pleurisy or pneumonia, for tired or overworked animals, as well as in cases of founder and paroxysmal hemoglobinemia. The laxative action is the complement of the diuretic action, but it is particularly applicable to horses affected with enteritis, for old horses, thin horses, or for those in bad condition.

As coffee is made in the morning, the grounds are given in the morning. A dose of about two pounds per horse may be mixed either with oats or with toasted bran, but it is preferable to give it in a soft bran mash.

Very rarely do the animals refuse to eat the mash, while with oats or toasted bran they show a certain repugnance. If it can be administered in no other way, the ration can be left in front of the horse

until it is eaten. They can sometimes be tempted by adding a mixture of pieces of bread. After the horse has been induced to eat the first feed, it will be eaten thereafter without objection.

Observations show plainly the good results that can be obtained by feeding coffee-grounds to horses.

Coffee-grounds can also be used to make powdered carbon by placing a certain amount of the coffee-grounds upon a coal shovel and placing it over the fire in a forge until they are transformed into carbon when it can at once be ground into a fine powder that gives excellent results in the treatment of superficial wounds.

NO TESTICLE THERE

At the clinic held by the A. V. M. A., at Detroit, two years ago, I had sent in a seven-year-old ridgling, one testicle up.

This horse was operated upon by Dr. I. W. Klotz, of Indianapolis, if I remember correctly. He produced a cord and claimed that was all there was to it. Dr. Wm. M. Bell of Nashville, Tenn., differed and undertook to produce a testicle but failed.

There were about 250 veterinarians in attendance, about equally divided as to whether this horse had a testicle or not. One side claiming the cord was all to be found in some cases, the other side claiming the testicle must be produced in all cases.

I received a telephone call from Mr. Strong, the owner of the animal, on November 23, notifying me that the horse was dead. I made a thorough search of the pelvic and abdominal regions (also the thoracic) and no testicle was to be found. I found the stub ends of the cords. The disposition of this horse did not improve following the operation but continued to grow worse. The owner remarked, "I'm glad he is dead as he was getting dangerous to have around."

Evidently castration has little effect on the disposition in a great many cases.

I received many letters from veterinarians who were present at the clinic asking me to inform them of the outcome of this case. By giving this matter publication you will settle this question and render a service to those whose addresses I have mislaid.

Pontiac, Mich. J. W. BRODIE, V. S.

IMPACTION OF THE LARGE INTESTINE*

This malady or disease has given me more trouble and has puzzled me more as to a satisfactory treatment than any other disease, during the past five years. It consists of a complete impaction and obstruction of the large intestine, the colon or cecum. If in the colon, it is usually at the pelvic flexure, as this is the narrowest part of the double colon. The impacted matter consists of dried, partly digested alimentary contents.

Any debility or atony of the intestines predisposes to this condition; all conditions of debility and all prolonged ill health tend to operate in this way by lessening vermicular movement. Indigestible food contributes to impaction, especially if the animal does not have access to plenty of water. Lack of exercise also is a factor in the cause of this impaction.

Symptoms. The animal paws, turns his head toward the flank, lies down and rolls, but not so frequently as in acute indigestion or spasmodic colic. There is less swelling in the flanks than tympanites from fermented food. The animal will sometimes back against the wall or fence, or set up on its haunches, and when standing there is a disposition to stretch the forelegs forward and the hindlegs backward. This symptom is apt to mislead the owner and cause him to believe that the animal cannot urinate or that his kidneys are affected. Another common symptom is the frequent passage of urine in driblets, due to the irritation of the bladder by pressure of the impacted colon during straining. The condition may last for six or twelve hours or for as many days, and may terminate in enteritis, auto-intoxication or rupture of the intestines.

In almost all cases purgatives will have been tried before a veterinarian is called, and he will not have to regret giving them as an error; still cases will undoubtedly occur in which the symptoms will be so obscure that the practitioner will administer purgatives to the great detriment of the patient.

Inasmuch as this trouble occurs more frequently in old mules than in young ones, it is not wise to give aloes or any drastic purgative. I reiterate, don't give aloes; don't give salts; don't give "Sloan's colic

*Read at meeting of the Georgia Veterinary Medical Association, October, 1918.

cure" or any other patent medicine that contains opium or morphine, these being contra-indicated in this trouble.

For the past three years I have relied on stramonium (Lloyd), and while I do not regard it is a specific, it will, I believe, cure more cases, than any other single remedy, as it acts as a sedative and anodyne without checking the secretions as does opium and its alkaloids. I give it singly in two-dram doses or combined with a stimulant, such as tincture of capsicum and tincture of guaicum, if I get the patient at the beginning of the trouble. My prescription is tincture of stramonium, two ounces; tincture of capsicum, tincture of guaicum, each three ounces, making an eight-ounce mixture of this; give one ounce every hour until three doses have been given. This is to be given in a pint of water. At the same time I usually give hypodermically one dram of physostigmine (Lloyd) every thirty minutes until three or four doses are given.

I believe that enemas and back-raking have done more harm in these conditions than good. In an already highly congested bowel they are likely to produce a severe form of enteritis. As a cathartic, if the horse is young and I get the case before it is too far gone, I still risk an aloes purge, and in an old one rely on a combination of rhamnus californica, chionanthus, and sodium phosphate. In this connection I wish to state that treating horses in the North for impaction is quite different from treating them in our Southland. When called to a case of this kind in Illinois I first gave a dose of chloroform and compound spirits of lavender, until the pain was somewhat relieved, then I would give an aloes ball, and by morning I would get good results and the animal be on the way to recovery; but not so in the South, especially in very old mules. Here the veterinarian is usually called up at one o'clock at night to go ten or twelve miles to the country to see a mule that has been sick since the morning before or longer and is met by the Caucasian, who says, "Doctor, I thought he had the colic and gave him a whole bottle of Sloan's colic cure, and a pound of salts, but now I found out it's his kidneys and give him a quart of gourd seed tea." About that time the darky standing on the other side who has been listening says: "No, Doctor, I know what's de matter of dat ar mule; he's got the grubes, I know he is. We done give him a pint of sorghum and sage tea to make them let loose."

La Grange, Ga. G. W. BROWNING.

EXPRESSIONS COMMON TO THE HORSE MARKET

The expressions that are heard in the sale ring of the large horse markets should really be classified under the headings of unsoundnesses, defects, blemishes and stable tricks and vices. But for all practical purposes the knowledge of the meaning that horsemen attach to them is sufficient for all needs. To the individual who is not familiar with these terms, they have little meaning and he does not attach much importance to them, but from one who has learned their meaning through his bank account, they have a peculiar significance that to all horsemen is a common law. One can scarcely hope to become familiar with all the expressions of the horse market, for there are new terms and expressions coined every day.

There are several expressions that the seller uses in an effort to effect a sale and to impress the buyer with the value of the horse. It can easily be understood that under sale-stable conditions excuses for many faults of the horse may be easily found. A horse is said to be "chancy" when he is apt to develop into an unusually good horse that will be an exceedingly good investment. He is said to be a "little green" when he does not work as well in harness or under saddle as the ordinary horse. He is "breedy" when he shows evidence of being of unusually good breeding. He is "tucked up," "gaunt" or "had a long ship" when he is drawn up in the flank and does not show a good full well-rounded abdomen. When he has been in the stable for some little time and does not look as bright and attractive as he should, the common excuse is, "he is just over his sickness." If the animal has been in the market a couple of days or more and runs with a slight defect in his breathing it is usually said of him that "he runs with a cold."

When one buys a horse in the market at an auction and finds after the purchase has been completed that the animal was not fairly described when he was sold or was misrepresented in any way, or that

the animal is unsound or has any vices that were not mentioned, he may go to the consignor and demand that a certain amount of money be deducted from the selling price of the animal; this is termed "bushing."

When a horse is "sold at the halter," he is sold just as he stands and the buyer has no resource after the deal is completed. "Legs go" means that all the defects, blemishes or unsoundnesses that may be upon the animal's legs will not be any excuse or reason for any recourse upon the part of the buyer. "Work only" means that the animal will work and nothing more is guaranteed. "Wind and work" means that the animal has good wind and will work and nothing more is to be reasonably expected. When an animal is sold to "hitch" he is guaranteed to work in harness and nothing more unless specified.

By "good age" the horse is usually meant to be from ten to fifteen years of age. "Smooth mouth" means that the animal may be any age beyond ten years. "Full mouth" means that the animal is six years of age and has his permanent set of teeth. "Just a baby" means that the horse is very young, usually four or five years of age or under. "Parrot mouth" means that the horse's upper teeth project beyond the lower ones. "Under shot" means just the opposite.

"A grade" is a horse whose breeding has not been along the same lines and therefore he is not pure bred or of pure breeding. "A half-breed" is an animal that has one parent that is well bred or pure bred, the other parent being a grade. "Cold-blooded" means that the horse has a strain of draft blood in him and usually refers to light-harness horses.

"Feather in the eye," "blue eye," "speck in the eye," "cloudy eye" and "smoky eye" all mean that the horse has some unsoundness of the eye, and no guarantee is given with him so far as eyesight goes unless it is specified that it is in one eye only.

When a horse stands with his front knees quite near each other he is said to be "tied in the knees" or to be "knock-kneed." If he stands with his knees bent forward more than they should be normally, he is, "over in the knees" or "stands a little careless"; if it is only in one leg it is so stated. When he stands the reverse of this he is said to be "calf-kneed" as that is the way calves stand. A horse that is "knock-kneed" may also be termed "bench-legged," while the horse that is "over in the knees" is often said to be "buck-kneed." A horse that stands with his heels together and his toes pointing outward is said to be "toe-wide," "splay-footed," "Charlie Chaplin," "base-narrow" or "nigger-heeled." The horse that stands the opposite of this is said to be "pigeon-toed" or "base-wide." "A hair off the hoof" or "a little rough on the coronet," means that the animal has a side-bone or a ring-bone.

The horse whose back is higher than it should be and presents a curve upward is said to be "hog-backed" or "roach-backed." The horse which is too low in the back is "sway-backed." The horse whose neck is much lower in front of the withers than it should be is "ewe-necked." The horse that is very small around the body through the flanks is "herring-gutted," and it is often said of him that "he needs a corset." If the animal is very thin through the body it is often remarked that "he looks like a sunfish." A horse is "flat-ribbed" when his ribs do not form a nice rounded curve from the backbone, but rather form a straight line.

An animal with a very sloping rump is "goose-rumped," while one with very little development of the muscles of the ham are said to be "cat-hammed." "A sickle-legged" horse is one whose hind legs are more crooked than they should be. "Straight in the legs" means that his hind legs are too straight. When the points of the hocks are too near each other and the animal stands with the toes pointing outward he is "cow-hocked." "Michigan pads" are puffs on the outside of the hocks just below the location of thorough pins. "A little rough behind" or he has a "jack" means that he has a spavin. If he jerks up his hind leg while walking or turning more than the average horse under normal conditions he is "stringy" or "crampy." This may be due to chorea.

If the horse has the habit of biting the stall or manger or other objects and then pulling back at the same time emitting a short grunt, he is a "cribber," "crib-biter" or a "wind-sucker." If he weaves from side to side in the stall he is a

"weaver." "A bobber" is a horse that has a peculiar bobbing movement when he walks which is usually the result of some disease that has affected the animal at some previous time; by some he is said to be "bobby."

"A bull," is a horse that makes a grunting sound when one makes a pass at him. When a horse is off in the wind he is, "windy," "wind-broken," "a roarer" or a "whistler."

Horses are not often sold as sound, but may be sold as serviceably sound with some defects pointed out. An absolutely sound horse is not as common as one would suppose, when defects, blemishes, tricks and vices are taken into consideration. Lieut. G. H. Conn.
Camp Green, N. C.

THOUSANDS OF RANGE HORSES AVAILABLE FOR FOOD

I notice in the December issue of the Journal, an article referring to the use of horse meat as food.

The thought of using horseflesh for food occurred to us several months ago, and in this connection we had a partial survey made of the State of New Mexico through our county agents, in the hope of ascertaining the number of horses that were running wild on the ranges. In this connection a number of letters were written with gratifying results. In Otero and Sierra counties of this state, there are available at present some 7,000 horses, weighing from 450 to 1,000 pounds. These animals can be purchased, I am told, from $10.00 upward.

We have also written to Washington to inquire if a market could be opened in Europe, where cheap meat would be in demand. These horses are all in slaughtering condition and have been raised practically in a wild state on the ranges; hence it is reasonable to suppose that they are healthy and free from disease.

I want to assure you that the Extension Division and the State College of New Mexico will be very glad to furnish any information you may require on this subject in the interest of extending investigation and discussion of the subject.

E. P. Johnson,
Extension Veterinarian,
State College, New Mexico.

FATAL HEMORRHAGE FROM INCISING TUMOR

A horse was brought to my hospital recently, with a large swelling on the side of the neck, about six inches back of the atlas, and just superior, or on the upper edge of the brachiocephalicus (levator humeri), and on the external surface of the splenius.

The owner stated that the swelling had been present for some time, and that he had been bathing it with hot water and using liniment, with no apparent effect.

The swollen area was about six inches across and was elevated about two inches above the surrounding surface. It was quite hard; cool and not painful.

I cleansed the surface with germicidal soap and water, and made a small opening in the center of the lump with a lancet, through the skin and a hard bony substance. Dark clotted blood began to escape, and I made the opening larger to facilitate removal of the clots. Just as I was about to remove the last of the clots, there was a great rush of arterial blood, which I was unable to stop. The blood appeared to enter the cavity from all sides, and pressure on any side or part seemed to have no effect in stopping the flow; pressure on the outside likewise produced no effect.

As my efforts proved futile, I decided to pack the opening and remove the animal to some place where it could die peacefully.

At autopsy I opened up the growth and found that it had a very uneven surface, the inner surface resembling the inner surface of the brain cavity, and feeling much the same. It was lined with bone and in some places was about the thickness of a clam shell, in some places thinner, and in some places there was merely a network of bone. Throughout the entire growth there were numerous holes.

It is noteworthy that this growth was not near the large arteries and veins nor near the carotid or the jugular, and was too near the surface to touch any large branch of the superior cervical artery. I also observed that it was in no way connected with the transverse processes of the vertebrae.

I shall be pleased to have this case diagnosed for me, and to have readers

tell me how the growth was formed, and the probabilities as to how long the horse would nave lived if left alone.—W. M., Alberta, Can.

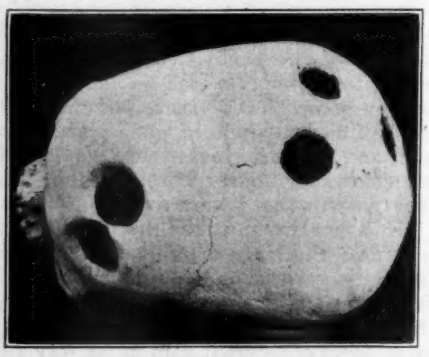
"OUT OF OLD BOOKS COMETH ALL NEW SCIENCE"

In your December issue I read with interest the comment of Dr. P. C. Juhl, G. R. V. C., of Copenhagen, now of Tottenville, N. Y., regarding my article on "Permanent Urethrotomy" which appeared in the November issue.

He writes, "I was naturally surprised to see this operation mentioned as something new, when as a matter of fact it is almost a matter of ancient history. In 1883 I first performed this operation on a horse in New York city."

It would be a rather long search into the earliest history of this wicked world of ours if we decided to locate the party who first performed "permanent urethrotomy." However ancient medical works as well as more modern ones agree that in human practice it is almost as old as that universal, ever present epidemic gonorrhea, which from very early times has been, still is and will be with us.

Contracting and incurable strictures have been relieved in the human animal by permanent fistula of the urethra ever since Babylon became famous as a red light district. Zuckerandl gives Poncet credit (in his "Operative Surgery") for advocating the division of the urethra along the under side and spreading the severed stump fan-wise on the surface of the lower angle of the cutaneous wound in the perineal raphe. Veterinarians were quick to add this method of handling the urethra to other methods but the embroidering of just such buttonholes as Dr. Juhl and I perpetrated on our virtuous and unsuspecting patients has been considered good surgery for a great many years. Balzac tells us that nothing in all this world is more virtuous than a gelded mule, and it may be that the virtue of our patients has much to do with making this a rare operation, but because a veterinarian performs this operation on a horse or mule does not give him patent rights over the ancient leech any more than a farmer who splices a rope has priority papers over the sailor.



TREPANNED SKULL FOUND IN PERU

This, the most remarkable skull yet found in Peru, has five holes, the edges of which show evidence of healing. There is every proof that the patient survived the operation.—*National Geographic Magazine.*

Before any operator claims any operation to be the child of his brain it would be well to hunt up some of the ancient history and find out a few things. Very likely he will find the operation has a pedigree as long as the way to Tipperary. I am sure that the veterinarian has never been far behind his medical brother, and as a whole they are better surgeons, daring any operation that is feasible. When one stops to think that removal of large sections of the skull became fashionable when slings and stones were doing the work of T. N. T. and shrapnel and that the poor Peruvian Indian dared to trephine as many as five large openings in one skull it makes a recent work by a noted surgeon famous for "decompression" operations seem like *more* ancient history. Very evidently cesarean section was no novelty when that disturber of German kultur came to town, and as the veterinarian has always shared with and borrowed from the human practitioner I would hate to think that the party who shared the existing knowledge of those ancient days would be overwhelmed by such a thing as the necessity of one nicely embroidered buttonhole in the urethra. Entirely new operations are few, very few. Modifications of old ones are plenty enough and improved instruments and after-treatment make our work more certain, but men who are solving old problems in a new and never before tried way are pretty scarce along this border, but if I do produce a new operation it will be issued not as a case report but heralded as an invention in very bold type.

What I attempted to describe in my little article in the November issue was simply a case report, and I had no thought of laying claims to originality in the operation.

ADRIAN V. HALL.

Oxford, Pa.

INFECTIOUS ABORTION IN CATTLE

It is believed that abortion is most frequently introduced into the herd through the purchase of pregnant or recently freshened cows although it may be introduced by breeding to a neighbor's bull, and perhaps in other ways not yet fully understood. Newly purchased females, though they do not abort, may be carriers of the infection.

When abortion manifests itself in a herd, immediate steps should be taken to ascertain if it is infectious. This is best determined by a blood examination. Any one may have this test made by sending about one ounce of blood from each animal to be tested to the Experiment Station Veterinarian.

When abortion first manifests itself in a herd many dairymen are tempted to sell for beef the aborting animals, thinking that the infection may be eliminated in this way.

It is not advisable to attempt to eliminate the infection in this way. There are two reasons why this is so. First, the extent of infection in a herd cannot be measured by the number of abortions since many infected animals carry their calves to maturity; and second, when many animals are sold for this reason it becomes necessary to purchase new animals to maintain the herd, and in so doing one is likely to introduce a more virulent strain of infection than already exists. If aborting animals are properly handled they may develop into regular breeders and should not be sold simply because they have aborted.

There are no known cures for abortion. Many proprietary preparations are to be found upon the market, both medicinal and the so-called bacterins and serums, but none of these has proven sufficiently effective to warrant its recommendation.

There are no measures by which the infection can be completely and surely eliminated from a herd other than disposal of the entire herd. It is more likely that once the infection is introduced, it will remain more or less indefinitely, but this characteristic of abortion should not discourage one from going on with the cattle business.

There are measures by which one may reduce the percentage of abortion to such an extent that dairying and calf production may be made profitable. There will perhaps be a few abortions each year but its ravages may be checked. There are no easily applied measures, but ones which require persistent effort, not for a week or a month but for the entire time that one remains in the business of producing milk and calves. The only measures that have proven effective are stable hygiene and disinfection.

To enable one to most effectively apply these measures one should know the ways by which the abortion bacilli are eliminated from the infected cow and the ways by which the micro-organisms enter the body of the susceptible cow. The discharges from the uterus and the milk are the most important of the former, and with the feed and water and by the bull the most important of the latter. In fighting abortion one must aim to kill the micro-organisms as they leave the infected cow on the one hand and protect the feed and water and the bull against infection on the other. The first is accomplished by daily disinfection of the posterior end of the cow, including the udder, and daily disinfection of the floor and gutter. The policy of milking the first few streams of milk into the gutter should be discontinued. To disinfect the posterior end of the cow, a brush and pail of disinfectant should be employed. To disinfect the floor and gutter, a thirty-gallon spray pump mounted on wheels should be used. This may be filled with a reliable disinfectant and affords a most convenient method of spraying the floor and gutter.

To lessen the danger of spreading the infection by the bull, no cow should be served as long as there are any discharges from the reproductive tract, and the belly of the bull should be disinfected and the sheath flushed with an antiseptic solution before and after service. For the former one may use the disinfectant used for washing the external parts of the cow. For the latter about four ounces of borax to one gallon of water. The tuft of hairs around the sheath of the bull should be kept clipped.

Further researches may suggest other

precautions but the above recommendations are in conformity with our present knowledge of the disease. For further information write to the Experiment Station Veterinarian.

E. T. HALLMAN,
Veterinary Section.

Mich. Agri. College,
E. Lansing, Mich.

A FIELD FOR LOCAL VETERINARY ASSOCIATIONS

With reference to the question of unity between neighboring practitioners, it must be confessed with regret that in very many instances, instead of unity, peace and concord, there is marked opposition, and not infrequently bitter feeling, jealousy, and enmity. Without doubt, if local veterinary associations were established in every district, a better state of things would prevail, and many of the differences would be swept away. Of course, we recognize the fact that some men are impossible to "pull with," while others practice according to the true business spirit of Jonas Chuzzlewit, viz., "Do others, because they will always do you." Again, the pariah who seeks to obtain clients by dishonorable means, and who cuts down fees to starvation point, is unfortunately too well known as an enemy to unity. Probably a local veterinary association would convert some, at least, of these black sheep.

It is not uncommon to find that when two practitioners oppose each other in a district where there is only room for one to earn a living, the principle of the two Kilkenny cats is followed to the letter, viz., "each thinks there is one too many." Unity under such conditions is impossible. A long experience in professional work leads one to the conclusion that nothing was ever gained by enmity and uncharitableness. A little consideration would show that, provided an honorable spirit exists among practitioners, unity could be maintained, and would lead to the advantage of all concerned. By no other means can the question of professional remuneration be settled in a satisfactory manner. The owners of animals are not yet sufficiently educated to recognize the fact that cheapness is not synonymous with efficiency, hence they are inclined to patronize the practitioner who places the least value on his services.

The commercial aspect is too frequently ignored by those who are regarded as leaders in the profession, and individuals who are in receipt of good incomes, or have laid by a "nest egg," prate glibly about status and dignity. But let it be remembered that unless fair remuneration can be obtained, the right class of men will not be attracted to the profession. Combination, unity and organization are a necessity in the present day, and we need only look to the medical profession for an example of success in this direction.—E. WALLIS HOARE, M. R. C. V. S., in *The Veterinary News,* London.

FALSE CORPARA LUTEA IMPORTANT IN STERILITY

As evidence of my appreciation of the articles appearing in your Journal on "Infectious Abortion and Its Complications as a Cause of Sterility," by Dr. E. T. Hallman, I have read every word of every article.

The following paragraph of Dr. Hallman's article is quoted from page 595 of the December issue of your Journal.

"As to other ovarian diseases little can be said. There is much discussion as to the relative importance of the persistent corpus luteum. That in many cases of absent estrum, a corpus luteum is to be found in one ovary is not denied. As to its significance we cannot say. We have on several occasions examined animals that failed to show estrum after abortion or calving, and upon removal of a corpus luteum from an ovary the animal would show estrum in a few days. That the presence of the corpus luteum inhibited estrum in these cases was very evident. Albrechtsen explains these cases by saying, 'The corpus luteum found in sterile cows originates from a normal ovulation that has been overlooked.' Hess is a champion of the theory that the corpus luteum may be retained without any visible changes in the genital organs. Further that it does not atrophy when the contents of the uterus are abnormal. The former condition may be the result of malnutrition. The latter may be the result of reflexes from the uterus. In practice we make it a rule to dislodge the corpus luteum if there is a history of absence of estrum. If the animal comes regularly in heat, we leave it alone. It is not always possible to tell clinically that a persistent corpus luteum is diseased. There may be more or less soft-

ening or cystic degeneration or it may be retracted into the deeper parts of the ovarian tissue."

I have been quite interested in the problem of sterility of bovines since 1908 and have given much of my time during the past three years to this work, consequently I have had occasion to examine many animals that were not regularly conceiving, this irregularity of periods of estrum or conception varying from five months to three years from the previous parturition, and my experiences have led me to regard the presence of false corpora lutea (let them be either cause or effect) *as of great importance,* in fact the more experience I have in this work, the more I am inclined to believe that pathological conditions of the ovaries, tubes and uterus causing sterility, that are not correctable by the crushing of cysts, the dislodging of false "yellow bodies," thorough and repeated massaging of the ovaries and uterus, and the local treatment of the cervix if necessary, are in most cases not worth treatment either as a business proposition or a professional attainment.

This is meant to express my lack of faith in uterine irrigation in chronic uterine or ovarian troubles. To me its value is always questionable after the uterus has become involuted, and not comparable in results obtained by the squeezing out of the "yellow bodies," massaging the ovaries and uterus to relieve chronic endometritis or uterine catarrh and even in chronic pyometra unless the case can receive prolonged constant attention, which is only practicable in unusual cases or very valuable animals, and then with an uncertain prognosis; in fact in these cases we will fail to accomplish the desired results without the aid of massaging after the uterus has cleaned up fairly well by drainage and irrigation.

This is in no sense a criticism of Doctor Hallman's splendid, practical articles. I am simply recording my experiences, and if every veterinarian who is doing this work will at once favor your publication with his opinion and experiences on this point, we shall be pretty sure to gather some useful knowledge that will prove of great value to all of us interested in this comparatively new work.

J. F. De Vine.

Goshen, N. Y.

MEASURED HIS WIND IN A BUCKET

I was recently called to see a fine cow suffering from milk fever, the property of a pessimistic man (pessimistic from a veterinary standpoint), who had called me after persistent urging from a neighbor, who assured the owner that the cow would recover if he secured the services of a veterinarian immediately.

I made the call, treated the cow, and requested the owner to drop a card to me the next day, stating the outcome. This is the card, word for word:

"That cow got up about 10:00 p. m. and seemed hungry. I gave her a little hay and went to bed. During the night she ate all her hay, all her bedding and part of her blanket. In the morning she gave a bucket full of wind and one pint of milk. She is all right now and gives a good flow of milk."—J. H. W.

McCook, Neb. W. F. Jones.

TORSION OF THE SMALL INTESTINE

The accompanying photograph shows a torsion of the small intestine, which caused the death of a high-bred horse belonging to Hon. W. M. Chamberlain, of Kanona, New York. This torsion was

Torsion of the small intestine.

diagnosed before death and the animal destroyed.

There was no previous history of the case. The animal had been running in the pasture, and was found sick in the morning. I was called but no treatment was given. The animal showed great pain, as was evidenced by drooling, haggard expression, etc.; pulse 120; temperature 94 degrees F. There was complete cessation of peristalsis; tympany confined to the region of the torsion.

CHAS. E. STONE.

Prattsburgh, Pa.

HAIRLESSNESS AND GOITER IN NEW-BORN ANIMALS

The results reported by H. Welch in Montana Station Bulletin No. 119, show that a disturbance of the function of the thyroid gland is the immediate cause of hairlessness in pigs, lambs, and calves, and of weakness in colts. The occurrence of hairlessness in pigs appears to be independent of any system of feed, care, or management as yet practiced, and is not due to infectious abortion. The enlarged thyroid glands were found to be very deficient in iodin, which has been demonstrated to be the essential element for the proper functioning of the gland and when supplied to the female breeding stock during gestation is apparently effective as a preventive of goiter in the new born. The author advocates the feeding of iodin (potassium iodid) to pregnant domestic animals in sections of the Northwest where goiter is prevalent. This affection has been causing trouble for a number of years in sections of several northwestern states, including Washington, Idaho, North Dakota, South Dakota, Minnesota, and Montana.

VETERINARIAN MAKES RECORD AS COUNTY AGENT

The remarkable record made by Dr. D. E. Sawyer, veterinarian, as a county agent, operating at Marietta, Cobb County, Georgia, calls attention to a comparatively new field of activity for the veterinarian. Dr. Sawyer has the reputation of having built up Cobb county "from the ground up." He has organized pig clubs, canning clubs, and seed clubs. At the Southeastern Fair held at Marietta, Ga., he put on a corn show, a wheat show, a pig club show, and made one of the best showings ever made by any county, the exhibits winning a number of championship prizes. Dr. Sawyer is a graduate of the Kansas City Veterinary College, and the only graduate veterinarian county agent in Georgia.

A Georgian in writing us concerning the foregoing, says:

"Just a little more information concerning Dr. D. E. Sawyer, who is County Agent of Cobb County, Ga., and concerning whom I send you a clipping.

"At the Southeastern Fair, Atlanta, the Boys' Pig Club of Cobb County won the following prizes: 25 Ribbons, 6 Firsts and 5 Seconds, 3 $50 silver cups out of four offered, and $192 in cash prizes.

"At the same Fair a Cobb County boy won a Special Premium, a Short Course Scholarship at the State College of Agriculture, for the Best Wheat Club Exhibit.

"At the Georgia State Fair at Macon the Cobb County Pig Club boys won 33 ribbons, 19 First prizes, one silver cup, 2 pure-bred gilts worth $50 each and $286 in cash prizes.

"The Boys' Calf Club of Cobb County also took their share of prizes.

"During the two years in which Dr. Sawyer has been County Agent of Cobb county the yields of corn and wheat have nearly doubled. The farm boys of the county have been made to see opportunities in farming that they never dreamed of before. The older farmers and the live stock men of the county swear by "Doc" Sawyer and are praying the extension authorities of the college that no other county be permitted to get him away from them. Dr. Sawyer has certainly made good and has won his way into the hearts of the good people of Cobb County. There is more interest in better farming in that county today than there has been in a decade of the past.

"Mrs. Sawyer is Girls' Club and Home Economics Agent in the same county and has also made a success of her work.

"This couple have found their opportunity for service to their country and are making good at it.

"This is a line of work in which I think there lies a great future for the veterinarian who can take a broad view and an active interest in educational work. The

returns are fully as good as the average veterinarian makes in practice and I cannot but believe that one who lives such a life of beneficial service will make a name for himself of which he need not be ashamed. It is popular nowadays to cuss the County Agent. Let's not do it. He does his best according to his light. Let us get a few good, practical, well educated veterinarians into these positions in the various states and show the others what a good county agent ought to be."

STOMACH WORMS OF SHEEP

Preliminary investigations indicate a high percentage of stomach worm infestation in the sheep of the state. All of the animals examined were found to be quite heavily infested with both the twisted wireworm (*Haemonchus contortus*) and one of the smaller stomach worms (*Ostertagia circumcincta*), while a number of other species of worms were present in the stomach in greater or less numbers. In some instances the infestation was so heavy that the stomach was literally lined with a thick matting of these worms.

These parasites injure the host in the following ways: They suck blood from the host; they secrete a substance which impairs digestion, destroys red blood-cells, and sets up serious nervous disorders; they puncture the lining of the stomach, thus creating numerous small bleeding and inflamed areas, which condition facilitates the entrance of injurious bacteria into the blood of the host. Animals heavily infested become weak through loss of blood and inability to properly digest their food, lose flesh, and, in time, die if relief is not given. Serious yearly losses to sheep raisers in various parts of the United States, due to these worms, are reported by the Bureau of Animal Industry, the death rate among lambs being particularly high.

The life history of these worms is, undoubtedly, direct—that is, the presence of an intermediate host, in which part of the life cycle of the worm may be spent, does not appear to be necessary. The life history of *Haemonchus contortus* has been carefully worked out by Dr. B. H. Ransom. (Ransom 1911.) It is briefly, as follows: The eggs, which are produced in great numbers, pass out of the host in the feces and hatch in a few hours, days, or weeks, according to the temperature. The newly hatched worms feed upon the fecal matter in which they live; and, within a few days or weeks, depending upon the temperature, develop into free-living forms which are closely enveloped by a thin, tough sheath. These ensheathed individuals are able to move about freely. They crawl up blades of grass or other objects where they may be easily swallowed by sheep or other ruminants. Upon reaching the stomach of a new host the worms continue their development, becoming fully grown in two or three weeks.

The ensheathed individuals are very resistant and are able to stand repeated freezing, drying, etc., without injury. Also the adults are able to live for many months in the stomach of the host, during which time the female deposits a great number of eggs. These conditions make it practically impossible to prevent sheep from becoming infested. Practical measures for the control of stomach worms are, therefore, difficu't to employ under the present methods of sheep raising. Medicinal treatment may, however, be employed with good resu'ts, as a means of relieving heavily infested individuals. The treatment worked out by Dr. Hall and Mr. Foster as probab'y the most satisfactory consists of drenching individual sheep with 1⅔ ounces of a one per cent solution of copper sulphate. Using the apparatus designed by these investigators it appears that two men are able to drench sheep at the rate of 100 per hour under practical conditions. (Hall and Foster, 1918.) To obtain maximum efficiency the sheep should be fasted for about 12 to 24 hours previous to drenching.

In view of the fact that most pastures are probably very heavily infested with the young, resistant stage of the worms, and the fact that such a short time is required for the complete development of the worms in the host, it is obvious that medicinal treatment must be given frequently, if the animals are to be kept free from the worms.

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PILOCARPIN

Pilocarpin is official in the U. S. Pharmacopeia as both hydrochlorid and nitrate. Both are quite soluble in water.

The alkaloid is obtained from Pilocarpus jaborandi (Holmes) or Pilocarpus microphyllus Stapf (*Rutaceae*). The chemical formula of the hydrochlorid is $C_{11}H_{16}N_2O_2Hcl$.

Pharmacology. Here again active-principle medicine is shown to advantage theoretically and practically in opposition to the corresponding galenical U. S. P. fluid extract of jaborandi.

Pilocarpin is a powerful sialagogue and diaphoretic—the corresponding galenical may or may not be. Hence the necessity of using the definite active principle. The secretion of saliva is prompt and profuse. Its diaphoretic action in the horse is less than in man but the sialagogue action is prolonged. The mucous and other glandular structures of the gastro-intestinal tract are also stimulated to increased secretion. As shown by Waugh, pilocarpin is one of the few alkaloids that stimulate an increase in leucocytes.

The cathartic action of pilocarpin accounts for its frequent combination with physostigmin as a synergist. We account for this action on the bowels by the stimulating action of the alkaloid on the intestinal muscles, the nerve supply and secretion.

Pilocarpin is not used primarily as a febrifuge although as a result of its diaphoretic action and the consequent toxine elimination it does reduce fever.

Dr. George Gille, Ft. Wayne, Ind., who was recently re-elected sheriff of Allen county, Ind.

Therapeutics. In "Special Veterinary Therapy," Steffen well covers the technic and indications for pilocarpin in choke. He advises absolutely no food, but plenty of water and one to two grains of pilocarpin hydrochlorid, hypodermically.

The early stages of pneumonia and bronchitis respond nicely to pilocarpin but later must be used with caution if at all because of the tendency to edema.

Combined with physostigmin we sometimes employ pilocarpin in colic although arecolin may be used. In meningitis, effusions and dropsy, pilocarpin relieves the tension by reducing the amount of fluids present. Chronic dermatitis, such as eczema and psoriasis, have been successfully treated with pilocarpin in small frequently repeated doses. Emetin is much the better alkaloid for the latter if associated with pyorrhea alveolaris in dogs.

Pilocarpin is useful in failing mammary secretion.

Its most common use is in colic, constipation and impaction. Lynch recommends pilocarpin as an emergency remedy in volvulus, obstruction and intussusception after the failure of milder drugs. It is best used in combination with eserin.

"For agalactia use is made of one grain each of pilocarpin and strychnin every three hours for three doses. In laminitis, pilocarpin hydrochlorid in two-grain doses night and morning (hypodermatically) is of great value—the usual local cold application and loosening of legs are observed in connection."—QUITMAN.

Administration. The dose for hypodermic use as a cathartic for the horse is one to three grains repeated in a half hour if needed. The canine dose is one-tenth to one-half grain.

To reduce the tension and contract the pupil in glaucoma use is made of the two-per-cent aqueous solution. For this purpose pilocarpin is superior to physostigmin as it causes less pain.

FRANK B. KIRBY.

Chicago.

Queries and Answers

When To Perform Cesarean Operation

I have a case of dystocia in a sow that begins to look like a cesarean operation. I always put these operations off too long. Some pointers on when to decide to operate would not come amiss.—H. E., Colorado.

Reply: Deciding when to perform the cesarean operation in a sow is an easy problem compared to making the same decision in the dog or cat, for the reason that delay in performing the operation is not nearly so serious in the sow, and the veterinarian is thus given an opportunity to exhaust other means of effecting delivery. This does not mean that he may without disatrous effects exhaust the strength and vitality of the sow by delay. All that can be accomplished by the sow, even by the most prolonged effort may be accomplished in one to two hours by the use of pituitrin, so there should be no useless waiting "to see what will happen." Injection of water to which has been added powdered elm bark can be done without inconvenience and without loss of time. The injection should be made with a fountain syringe and the solution should be held in for a time. The pressure used should be secured by elevating the container about four feet (but not more) above the sow. This simple procedure is often effective, and where in itself ineffective it is an aid to instrumentation following. Instrumentation is useful in the sow only after the delivery has begun and the fetus has moved into the birth canal, so its use or uselessness can be decided upon quickly.

Should the foregoing fail to bring about the desired results, operation should be decided upon without delay. In perhaps a majority of cases requiring operation cesarean section may be avoided.

First an opening is made through the flank through which the right hand is inserted to grasp the fetuses through the horns or uterus. Commence with the pig nearest the pelvis, by manipulation with the right hand in the abdominal cavity and the left hand in the vagina, or with forceps delivery may be effected in cases where instruments would be wholly ineffective without the aid of the hand within the abdominal cavity.

When palpation of the fetuses has shown its futility, or an attempt to deliver them by the foregoing operation has failed, cesarean section should be resorted to without delay, since nothing can be gained by waiting, and as the animal will of course already have been anesthetized, the operation should be completed as quickly as possible to lessen the danger of prolonged anesthesia.

Technic for Cesarean Section

We know of no better technic for cesarean section in the sow, than that given by Lacroix in his "Animal Castration," which we reproduce herewith.

When performed at the right time, there are few operations that are productive of proportionately greater profitable results than this. In every community where hog raising is conducted there are certain seasons when dystocia in sows is very prevalent, and in many instances it is not to be ascribed to mismating or to any one definite causative factor. In the experience of every general practitioner in such localities, there are times when his skill and patience are frequently tried in handling cases of dystocia where he is undecided as to the feasibility of doing the cesarean operation. When he does decide to operate as a last resort and the result is unsatisfactory because of long protracted labor or septicemia occasioned by injuries to the vaginal and uterine membranes, inflicted with various appliances in the hands of laymen in their attempts to deliver the fetus, he is apt to view the situation, as frequently do his clients —that cesarean operation in the sow is impracticable. When this operation is performed as soon as it is evident that serious dystocia is present and when the genitalia have not been injured and infected as a result of manipulation

with obstetrical instruments, recovery should obtain in at least 75 per cent of the cases operated upon.

Indications for operating are cases of dystocia where active labor is not productive of delivery within 12 to 18 hours after labor has begun. As soon as it is evident that serious dystocia exists in any given case, there is every reason for operating early, and deferring the operation until uterine atony and beginning degenerative changes have taken place, lessens the chances for recovery. As a rule swine withstand laparotomies very well, and the cesarean operation should be performed more frequently than it is in veterinary practice, and when performed should be done early.

Anatomy.—There exists no essential difference in the anatomy of the abdominal wall in the region anterior to the external iliac spine from that of the horse, except that in sows there is usually found a heavy layer of fat interposed between the subcuticular fascia and the external oblique muscle, and the musculature of this region is proportionately less vascular than in the horse.

The uterus and its horns are supported by an abundantly large, broad ligament. The body of the uterus is very short and serves merely as a passageway between the horns and the vaginal canal. The uterine horns are very long and necessarily tortuous, and it is possible to bring any part of the horns to the surface of an abdominal incision without difficulty.

Anesthesia.—The problem of anesthesia in this work is one which has been given considerable thought by operators because they have learned from experience that many sows do not readily withstand the effect of chloroform, frequent losses being directly due to chloroform poisoning. Dilutions of chloroform such as A. C. E. in proportion of one part of alcohol, two parts chloroform and three parts of ether, constitute a very satisfactory anesthetic agent in selected cases. Subjects that have been bred, fed and otherwise cared for so that they have matured early, are apparently more susceptible to untoward results occasioned by inhalation anesthesia.

Rectal administration of chloral hydrate in dilutions of one part of chloral hydrate to twelve parts of tepid water, given in quantities of one drachm for each 100 pounds weight, will produce sufficient stupefaction to enable the surgeon to perform a satisfactory operation. In a few cases a solution of chloral hydrate is not retained, even when diluted with 16 parts of water. This may be due to a supersensitive rectal mucosa or a lax sphincter ani, and difficulties so encountered may be overcome by clamping the anus with a pair of forceps, thus preventing escape of the solution of chloral hydrate until a marked anesthetic effect is evident. As soon as there is sufficient soporific effect manifested the forceps should be removed to permit evacuation of the contents of the rectum, and in cases where it would seem necessary, the employment of an enema for the removal of any excessive amount of chloral hydrate is advisable.

Restraint.—If possible, the subject is placed upon some sort of improvised operating table (a barn door supported by tressels or boxes answers the purpose very well) and "hog tied" leaving either the right or left flank exposed for surgical invasion.

Equipment.—One should have at hand sterile towels or sheets, two or three curved needles threaded with silk, three or four curved cambric pointed needles threaded with No. 1 chromic gut, a scalpel, Kelley forceps, six or eight pairs of 8 or 10 inch compression forceps, scissors, absorbent cotton, sterile gauze and a basin containing any suitable antiseptic solution such as a one per cent solution of liquor cresolis compositus.

Preparation of the Field of Operation.—The hair should be clipped from a liberal area in the region just posterior to the last rib, and the skin may be cleansed with a swab and gasoline and then painted with tincture of iodin.

Technic.—An incision is made in the space between the external iliac spine and last rib, the direction of which is to be downward and forward and of sufficient length to permit comfortable access for manipulation of the parts to be dealt with. All of the tissues comprising the abdominal wall are divided with a scalpel, and hemorrhage, if of any consequence, is controlled by means of forceps. The flank of the subject is now covered with sterile towels and kept so until the operation is completed.

The hand is introduced into the peritoneal cavity, and by palpation it is determined whether one or both horns are gravid and whether a fetus is lodged, in part, in the body of the uterus. A horn (the one nearest the abdominal incision if it is gravid) is grasped and brought to the surface by gentle traction. At this time it is necessary to carefully examine the parts for the purpose of determining whether a hysterotomy or a hysterectomy is to be performed.

If there exists evidence of considerable emphysema of the fetuses indicating that degenerative changes involving the uterine horns have taken place, amputation of the uterus and horns should be decided upon. If both horns are gravid and particularly if more than one fetus is contained in each horn, hysterectomy should be done; it is very difficult to do a hysterotomy in such instances without producing laceration of some part of one or both gravid horns with probable contamination of the peritoneal cavity occasioned by escaping putrid fluids.

Where hysterectomy is decided upon the gravid horn nearest the site of incision is entirely withdrawn from the peritoneal cavity, and the broad ligament anterior to the ovary is

clamped with a pair of forceps. Another forcep is securely clamped near the ovary, and division of tissues between the two forceps is effected with the scissors, and by carefully tearing the attachment of the broad ligaments, the end of the gravid horn is removed from the peritoneal cavity.

The next step in the operation consists in causing the evacuation of the contents, if any, of the body of the uterus. This is done by a process of squeezing or milking out by digital manipulation. This having been done, two pairs of heavy forceps are securely clamped upon the body of the uterus with a space of about one inch intervening, and the body of the uterus is divided between the two pairs of forceps, thus permitting the removal of the bifurcated portion of the uterus which is held firmly closed by means of forceps. Repeating the process of rupture of the broad ligament by tearing or blunt dissection, progressing in the direction of the ovary along the horn farthermost from the opening in the abdominal wall, this horn is traced out to a point beyond the location of the ovary, and two pairs of forceps are clamped upon the broad ligament anterior to the location of the ovary, and the removal of the horn, oviduct and ovary is effected as has been previously described.

The amputated ends of the broad ligaments are ligated by means of a gut suture proximal to the position of the forceps, and they are then removed. The end of the stump of the uterus is lifted, by means of the forceps attached thereto, as nearly as possible to the surface of the abdominal wound, and its mucous lining is painted with tincture of iodin. The stump of the uterus is then ligated by means of a heavy gut or silk thread which is retained in situ by being fixed at several points with a needle and securely tied. This having been done, the forceps attached to the uterus are removed, and the abdominal wound is ready to be sutured.

The peritoneum and muscular layers of the abdominal wall are approximated by means of a continuous suture, using gut or a silk thread. The skin is united by means of a heavy silk or linen suture material, using a continuous suture, and the parts are painted with tincture of iodin and immediately coated with a layer of pine tar.

Indications for the performance of hysterotomy are in cases where only one uterine horn is gravid, or, if both horns are gravid, where living fetuses are contained in them, and there exists no apparent structural change involving the body of the uterus and cornua—in cases where labor has not existed for more than twenty-four hours and where the mucous membrane of the genitalia has not been seriously injured by means of instruments in attempting delivery.

If both uterine horns are gravid, the one nearest the abdominal opening should be brought to the surface and laid upon towels which line the wound margins and cover the surface of the body of the subject. An incision is then made through the body of the horn at a point rather near its dorsum. If there are several fetuses contained within this uterine horn, an incision is made over the body of the fetus lying nearest the uterus. The incision should be made parallel to the long axis of the uterine horn and of sufficient length to permit the easy removal of the fetus.

After having removed the fetus, taking care not to permit the escape of fluids which would contaminate the abdominal wound or possibly the peritoneum, the remaining fetuses are removed through the same incision. This is accomplished by digital manipulation of the horn—an assistant is of much help at this stage of the operation—and after having evacuated the contents of this horn, the other one is brought to the surface. If possible its contents are crowded out and by gentle manipulation the fetuses are extracted by way of the incision first made.

If attachment of the placental membranes prevents the transferring of the contents of the second horn across and by way of the body of the uterus through the first horn and out through the incision made therein, it is necessary to make a second opening for the purpose of removing the fetuses directly out of the horn in which they are contained.

After having removed all fetuses, any portions of fetal membranes are carefully removed, and by means of dressing forceps and cotton the interior of the uterine horns and the body of the uterus are carefully swabbed, removing, if possible, all of the contents. This having been accomplished, the two incisions made into the horns of the uterus are closed, using for this purpose chromic gut and uniting the wound margins with a Lembert suture.

After having mopped the wound margins with pledgets of cotton taken from the working solution, the uterus and horns are returned into the peritoneal cavity, and the wound margin is likewise cleansed of any possible contaminating materials and sutured as just described in hysterectomy.

After-Care.—In some cases there is marked evidence of shock following a cesarean operation, and hypodermic injection of 1-100 to 1-50 grain of atropin sulphate is beneficial. Animals should be placed in comfortable quarters and unmolested for a few hours until they have had time to recover from all shock incident to the operation. They should be given water *ad libitum* and offered a gruel of oil meal, shorts and water or other suitable nutritive and laxative food. No special after-care is necessary except to give the subjects every attention to make them as nearly comfortable as possible.

If pigs are delivered in a condition to survive, they are best taken away from the sow for six

or eight hours, after which time they may be returned, and if the case progresses favorably, she can nurse them almost as well as though normal delivery had taken place.

DO THESE TROUBLES TROUBLE YOU?

I would like to see the following subjects discussed during the next twelve months:

The possibility of restricting all laboratories from selling biological material used in veterinary practice to the lay public.

The possibility of the veterinarians in general practice abdicating in favor of county agents, farm advisers and agricultural graduates. It looks more and more that way if we don't remedy it.

What is the use of having veterinarians at all, when all who desire can go to the state agricultural school and take a short course in veterinary science, and then go home and practice veterinary medicine in his community?

Should not all this be stopped or at least an attempt made to do so, if we ever hope to have a veterinary profession of high standing, and respected as other scientific professions are?

What is the use of graduating any more veterinarians, and sending them out to practice, only to find when they locate that the state is doing all the vaccinating, tuberculin testing and other general veterinary work without which a practice is unprofitable in most localities?

I may be pessimistic, but the fact of the practice decreasing with the increasing use of autos, motor trucks and tractors and all the above-mentioned obstacles, I would like to know what the veterinarians are going to do?

D. MATTROCCE.

Los Banos, Calif.

DEATH FOLLOWING A NAIL PUNCTURE

Brown horse, eleven years old, had a puncture wound at point or apex of frog in left hind foot. The farmer removed the snag at once and six days later I was called.

Temperature 103°. Discharging pus above hoof at heel; leg swollen very little but very sensitive. I cleaned up the parts, dressed both openings with 1 to 1000 bichorid solution and packed with iodin and ether gauze. I had the horse put in a sling so he could stand or rest in the sling, but so he could not lie down. The wound was dressed daily for three days. There seemed to be less pain and swelling and the horse put little weight on the foot. On the fourth morning, I found the horse dead in the slings. Can any one suggest the cause of death, or a better line of treatment?—C. C. M., Can.

WHAT IS THE SOLUTION?

A friend of mine has a filly eighteen months old, which has been troubled with urine dribbling from the usual channel from the day of its birth. Is not this case very unusual? What can be done to cure the trouble?—P. L., Colo.

TONGUE-SUCKING STALLION

I have seen "cribbers" and "stump suckers," as they are called, but have never before seen a case like the following: A six-year-old stallion has had the habit of "tongue-sucking" since he was four years old. When standing quietly in his stall, he will suck his tongue with his mouth closed, making a slight noise. When he has a bit in his mouth and gets excited, he sucks the bit, a loud noise resulting from the air sucked in over the bit. I have found that changing to a smooth bit lessens the trouble somewhat. Can the habit be corrected? If so, will someone suggest a remedy?

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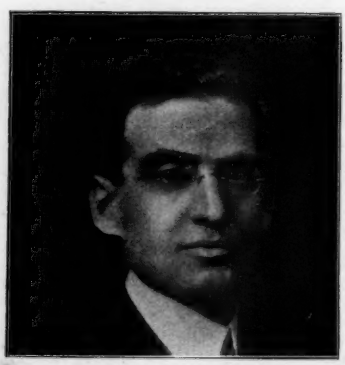

DR. J. F. DEVINE